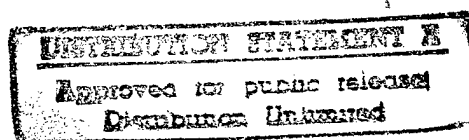


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# ***JPRS Report***



# **Science & Technology**

## ***Central Eurasia: Science & Technology Policy***

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# Science & Technology

## Central Eurasia: Science & Technology Policy

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8 October 1992

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## Financial Woes of St Petersburg Physics Institute Detailed

927A0270A Moscow *RABOCHAYA TRIBUNA*  
in Russian 21 Aug 92 p 2

[Article by Yevgeniy Golubev: "Economic Physics in Four Paradoxes"—first two paragraphs are *RABOCHAYA TRIBUNA* introduction]

[Text] "Now two days a week it is necessary to peddle vodka," one senior scientific associate said to another, also senior and no less scientific associate. "So that during the remaining five days there would be an opportunity to engage in science...."

This is not an anecdote. For the Scientific Research Institute of Physics of St. Petersburg State University, for example, the fine slogan of the self-financing of science turned out this way.... But meanwhile the oldest physics institute in Russia for the first time in its nearly century-old history found itself in a situation that everyone—from the laboratory assistant to the director—is calling "crazy," "catastrophic." In other words, according to the latest scientific data, the very existence of basic science under present conditions is a paradoxical phenomenon.

### The First Paradox. Abroad to This Day They Value Our Scientific Potential

"We will not last long on the old 'reserves'," Lev Basov, deputy chief of the photonics division of the NIIF [Scientific Research Institute of Physics], says. "Budget financing is meager—it is not enough for half of the associates, nearly all the economic contracts with industry have been cut off, the new commercial structures and firms, it appears, do not care about science. How is one to live without the support of the state? For research pays for itself at times very slowly. See, a group of scientists of the photonics division—jointly with the GOI—the State Optics Institute—began to develop an optical computer. A priority job—they could have been first in the world. The use of a new principle: the switching of components when exposed to low-power light beams, would have increased the speed of the computer by hundreds of thousands of fold. And such components had already been tested. Apparently, expand the research in order not to let success slip by. But...the Ministry of the Defense Industry refused to finance the basic part of the scientific research at the State Optics Institute. During January-March the scientists went without wages. Then they went on leave at their own expense. Well, what kind of "his own expense" can a scientific associate have? Of course, we also had to give up. Here an entire laboratory is 'tied' to the work with the State Optics Institute. How is one to work under such conditions?"

Indeed, the majority of academic institutions of St. Petersburg are today under the conditions of resuscitation. And there is no protection, as, for example, physicians, educators, or miners have. It is useless, after all, for scientists to go on strike.

"Yes, formally no one is striking. But in fact.... The consumption of electric power during the first quarter decreased by one-fourth. And this is in winter. Thus, consider that the intensity of work at the Scientific Research Institute of Physics decreased by a good third," L. Basov concluded.

While Academician Zhores Alferov, director of the famous Physical Technical Institute, summarized the financial affairs of his institute as follows: "For us the question of survival has arisen in all its magnitude."

"Our country is going through the stage of the collapse of the planned economy, the market is primitively organized. Under such conditions industry is no longer capable of financing scientific research, the new market structures are not yet capable of doing this," Vladimir Krasilnikov, prorector for scientific work of St. Petersburg State University, appraises the situation. "Support on the part of the state is coming for the present more in verbal form."

### The Second Paradox. If You Want To Live, Give Up Research.

The wage or equipment—such is the alternative that faces every manager of a scientific collective. It is clear to what he will give preference.... As a result instruments and hardware, which yesterday were still single-design, today are becoming obsolete and are going to ruin.

At times the most complete nonsense results. You are going through competition—there they look at what science you want to develop, what results you expect, and how much money to give you. Then you receive, say, your 300,000. And 200,000 of it you pay...for heat.

And it is completely awful. At the Institute of Physics, it turns out, there is equipment worth 50 million—in "old" rubles. It, of course, is wearing out. Earlier, as in any normal country, it was considered that it is necessary to spend 10 percent on depreciation—the state should invest not less than 5 million in the modernization of its institute. Now this money is not available—the collapse of the technical structure of science is under way.

"Physics depends entirely on equipment. Even theorists need at least computers. But for experimenters a good facility is the basis, without which it is impossible to work at all.... In a few years the institute has turned into a student laboratory: Everything is becoming obsolete!" Nikolay Borisov, deputy director for science, grieves.

The situation is as follows: Money is not being allocated for the maintenance of the buildings, structures, and equipment of the state institute. There is no other financing except for scientific projects. And it turns out that, having received a theme, you draw up yourself a cost estimate. The sum is the same—whether you buy equipment or deny your scientific collective wages. It is stupidity, but it is more profitable not to do anything at all.

**The Third Paradox. The Cleaning Woman Has Again Surpassed the Professor**

Vladimir Ryabchuk, a senior scientific associate of the photonics division of the NIIF, told me how awfully lucky he had been. Next to his house a kiosk with goods...had been robbed. And an acquaintance appealed to him: to keep at his place the unsold "goods." And he also asked him to bring the bags in the morning and in the evening to take them from the saleswomen.

"You know how awkward it was for me to drag the bags. I walked the first time like I could not lift my eyes. And it took only seven minutes to walk there and back, I mapped it."

And the luck consisted in the fact that these few minutes brought him more income than the month's wage of a senior scientific....

It is clear that many people are not enduring. At the Institute of Nuclear Physics, for example, the world-famous collective has lost a tenth of the scientific personnel. The Institute of Information Science has lost more than 20 percent, there are academic institutes, at which nearly one person in three has gotten his discharge.

At the university the situation with personnel is better. There were no "wholesale" layoffs. So far. Only young lads, who were not yet involved with anything, left. True, this stability of the staff is resulting in the opposite: The institute is aging rapidly.

The scientists of the NIIF, besides everything else, are still teaching at the physics faculty of the university. As a result of the last increase of the rates at the higher school a docent, who is a candidate of sciences, should earn about 2,500 rubles [R], while an ordinary instructor without a degree should earn R1,700. This is since June. In this financial table of ranks a cleaning woman long ago surpassed even a professor.... One of the latest ukases of the President on the social protection of graduate students and doctoral students specifies for them a stipend in the amount of R900. It appears that as before the principle, about which Ryabchuk told me: "The more interesting a job is, the less it is possible to pay for it," is in effect....

They say that the computers at the Physical Technical Institute and other St. Petersburg scientific research institutes are filled with letters addressed to foreign scientific centers with proposals to work a while for them. In principle foreign contracts are not as terrible as people mourn this when speaking about the "brain drain." Scientists not only solve there their own financial problems, but also, by working at leading laboratories of the world, pick up invaluable experience and are enriched by new ideas and methods. However, it is becoming clear: By depriving our scientists, we are helping the West, which is flourishing as it is.

**The Fourth Paradox. People Are Still Working**

Is science still living on bare interest? They revealed a secret to me: The last stronghold is scientific schools. But they are also already on the verge of collapse.

"The concept of a scientific school does not reduce to the sum of completed projects. This is a hard to define thing, but it exists. The schools in mathematical physics—of Smirnov and now of Fadeyev, in theoretical physics—of Fok...are well known. Having destroyed such a structure, it is impossible to restore it immediately," N. Borisov considers. "It is necessary to wait for a prominent individual, who will start all over again to generate a cultural stratum. This process is measured in decades."

Scientists can still return from abroad. It is bad when young and talented people leave science entirely—for trade, for "sovmestki" [joint ventures], for cooperatives.

"The flow of young people from science is a break of continuity, the destruction of the traditions of scientific schools. This is a crash!" Academician Alferov is convinced. "What basic science is going through today as a result of the economic and political situation in the country is more terrible even than what the policy of the state during 1945-1950 did with science...."

"In about five years it will be impossible to start all over again. The restoration of the scientific potential of the country should be expected no earlier than the next century...."

Will domestic science hold out long on bare interest? Or all the same "will the disintegration of what was created by the labor of scientists over the last 300 years begin"?—as was stated at a recent joint meeting of the presidium of the scientific center of St. Petersburg and the council of city hall for science? The question for the present is still open....

**Germany To Contribute DM40 Million to CIS S&T**

927A0274A St. Petersburg NEVSKOYE VREMYA  
in Russian 14 Aug 92 p 1

[Article by Elke Braun, journalist of the Berlin newspaper DER TAGESSPIEGEL, under the rubric "Express": "Without Elegant Diplomacy"]

[Text] This year 10 million German marks [DM] will be allocated by the FRG Government for joint scientific research programs with the former CEMA countries. In 1993 another DM30 million, two-thirds of which are intended for space research and hardware, will be added to this.

German Federal Minister for Research and Technology Heinz Riesenhuber, who on Tuesday visited St. Petersburg, reported this.

On Wednesday Riesenhuber summarized the preliminary results of his visit at a press conference at the

Smolninskaya Hotel. He emphasized the willingness of the German government to continue and extend contacts. The FRG Government will also participate in the implementation of the international scientific and technological center in Moscow. Its task is to make work in the civilian area available to the scientists who up to now have been engaged in the development of weapons of mass destruction. The idea of organizing the center, for the financing of which the United States has made \$75 million available, arose on the initiative of Secretary of State Baker, Minister of Foreign Affairs Genscher, and Minister of Foreign Affairs Kozyrev.

The German assistance program includes the support of individual groups of researchers and the improvement of the scientific research infrastructure. Scientific research institutes in the area of nuclear fusion, space research, oceanography and marine biology, and many other areas are already now cooperating. The program for the exchange of scientists of the Alexander von Humboldt Foundation has made 98 places available for long-term training periods. The German Academic Exchange Service and Deutsche Forschungsgemeinschaft are also giving financial assistance in scientific training periods (to undergraduates and scientists). Subsequently 500 computers, which had been in use, will be turned over to various organizations, while a large computer will be turned over to the Moscow Institute imeni Kurchatov.

On Thursday evening Dr. Riesenhuber met with Deputy Mayor V.N. Shcherbakov. During the conversation the establishment of an international research center attached to the Institute of Nuclear Physics in Gatchina, as well as a center for the training of personnel of nuclear reactors in Sosnovy Bor was discussed.

P.S. This is the first report of the woman journalist from the Berlin newspaper TAGESSPIGEL [as published] (Elke is now undergoing a training period at NEVSKOYE VREMYA).

### **Commentary on Tax Status of Official S&T Organizations**

927A0282A Moscow POISK in Russian No 32 (170),  
1-7 Aug 92 p 3

[Interview with Vladimir Shorin, chairman of the Committee of the Supreme Soviet for Science and Public Education, by POISK correspondent Nina Shatalova, under the rubric "What Is Science To Be Like"; date and place not given: "They Are Reading the Law in the Fall"—first two paragraphs are POISK introduction]

[Text] In the ukase of the president of the Russian Federation, "On Urgent Steps on the Preservation of the Scientific and Technical Potential of the Russian Federation" (see POISK, No 29), there is a point, according to which the government of the Russian Federation is ordered to draw up and submit proposals on easing the tax burden on educational and scientific organizations.

Today at the request of our correspondent Nina Shatalova, Vladimir Shorin, chairman of the Committee of the Supreme Soviet for Science and Public Education, tells about what has been done in this direction.

[Shorin] After study in our committee the Supreme Soviet passed a law on the making of changes in and additions to the tax system of Russia. The government was ordered within a month (that is, by June—editor's note) to draw up and submit proposals to the Supreme Soviet on the exemption of higher educational institutions, scientific research institutions, enterprises, and organizations of the Russian Academy of Sciences, and a number of other scientific systems, which are financed primarily from the republic budget of Russia, from the payment for land and the property tax. These proposals were made, and the Supreme Soviet accepted them for the most part.

The fact that exemption from payment for land is a very significant benefit, I think, does not raise doubt. Imagine an agricultural institute that has at its disposal 100 hectares of land. Now it will not pay for it and will be able to use it at its own discretion: to sublease it, to grow all kinds of crops....

But let us take another example—our Moscow State University. If it were not for this benefit, the university would have to pay several hundred million rubles a year for land, you know how high the prices for plots of land in Moscow, and also in such a privileged region as the Center, are. In other Russian cities this sum, perhaps, is not as great as in the capital, but it is doing serious harm to the finances of scientific institutions, which are suffering from a perpetual shortage of assets.

Now about the exemption of enterprises, which work in the area of science, from the payment of the property tax. In essence, the approval of this point will preserve for them a large part of the capital and will even help in the performance of a number of jobs. How? Imagine the following purely hypothetical example: Some plant is the owner of a single-design, but very expensive unit. Its director concludes a contract with a higher educational institution, which with pleasure will take upon itself this valuable—in all respects—equipment. Scientists receive an opportunity to use it for their work and to conduct the necessary research. And the enterprise will be exempt from the tax. But it is better, of course, to treat the laws honestly.

In the ukase the provision on the exemption from taxation of that part of the profit of associations and enterprises, which is channeled into the conducting of research and development, and from the value-added tax on this work is a separate line. The value-added tax is awfully irritating: You see one price, but, having calculated, understand that it is necessary to invest significantly more. Many enterprises due to this often have simply refused to conclude economic contracts. Now research and development, which are performed at the expense of the budget, as well as the assets of the Russian

Technology Development Fund, the Russian Basic Research Fund, and nonbudgetary funds of ministries and departments, are exempt from this tax. The overall level of the cost of operations will be reduced with the maintenance of all the other items of expenditures. Thus, the influx of orders to scientific research organizations will increase, which today is very important for us.

Whereas earlier scientific institutions turned the profit tax over to state and it decided independently how to use it—either to develop the maritime fleet or aviation—now all these assets will be used directly for the development of science, which earned it.

In short, a draft law has been drawn up. It remains to wait until the president signs it....

### Plan To Bring Science Through Economic Crisis Outlined

927A0267A Moscow *DELOVOY MIR* in Russian  
28 Jul 92 p 5

[Article by Doctor of Economic Sciences Prof. Aleksandr Varshavskiy, president of the Fund of Strategic Priorities: "Economic Reform: The Intersection of Opinions. How To Preserve the Scientific and Technical Potential of Russia. Reflections on the Results of One Scientific Examination"]

#### [Text] Introduction

After 1917 the physical extermination of entrepreneurs, the intelligentsia, specialists, and highly skilled workers in all spheres of activity took place in the name of a bright future. This was a kind of genocide of the intellectual potential of Russia. Now, unfortunately, the economic destruction and annihilation of the best, which had been able not only to remain intact, but also to develop and attain the world level, are occurring. The process of reducing the country to rags, which, perhaps, is even more severe in its long-range consequences, is starting again.

This is explained by the fact that our government, apparently, does not understand that shock therapy in Russia cannot produce the same results as in other countries due to the difference in initial conditions.

Such countries as Poland, Peru, Paraguay, and others did not have such a developed sphere of scientific research and development, they were characterized by a comparatively lower level of the scientific, technical, and production potential, particularly in the defense industry. The disregard of this difference, it seems, predetermined many failures of the first stage of the reform being carried out in our country.

Many foreign specialists consider that the achievement of a nondeficit budget is the most obvious means of bringing the economy into a stable state, which is characterized by a low level of inflation and a steady exchange rate of the national currency. The economic

system as if returns to its initial state, from which it is possible to begin movement along a different path with a new system of administration and under new conditions of management—with the stabilization of the financial status of the country and the reduction of foreign exchange indebtedness, the assurance of the commercialization of the work of enterprises with the subsequent changeover to a normal market mechanism and with their honest, fair privatization.

If one is not able to foresee the consequences of a monopolistic economy, then the preceding is actually the quickest and simplest means of changing over to a market. That is what the International Monetary Fund and the World Bank advise. That is also what was done on their advice in Poland, Peru, and several other, mainly backward countries. The program of the government also proposes to follow this advice. As American expert Sax explained, in this way in three months it is possible to get rid of the shortage—the shelves of stores will be filled with goods. (However, it is well known that this did not succeed in our country after either three months or half a year of reform....)

How are they advising us to increase the scientific and technical level?

The recommendations of many foreign economists with regard to the improvement of the quality of the output being produced reduce to the fact that it is necessary to eliminate completely the existing backward works and to build new ones.

Everything is correct: For the attainment of the world technical level, when starting from zero, it is necessary to invest in the best technologies. And the experience of the modernization of production in developed countries shows that, when trained manpower resources, a production infrastructure, and a high technical level of related industries exist, the tearing down of obsolete capital and new construction are most effective. For developing countries the scheme of the complete technical updating of the production potential is also obvious: the stimulation of traditional, as a rule, not science-intensive works (enterprises of the local light and food industries) and the gradual, stage-by-stage changeover to the construction of enterprises of other sectors of industry with the assimilation first of simple, then of more complex science-intensive technologies. This sequence of development was typical for South Korea, Taiwan, and a number of other new industrial countries.

However, this means cannot be recommended for a country with a substantial qualitative unevenness of development of the sectors of the economy. For example, it is irrational to tear down works, while it is possible to increase the technical level of products by importing individual components. Even if domestic products lag behind the best foreign models, they will be competitive as compared with them on the domestic market for a long time to come owing to the significantly lower price.

And it is that way in everything.

Numerous conversations with western experts and economists showed me that the West does not understand our problems. It lives in a different sociocultural and economic space with its own laws. We want to join this space, but for the present are in a different world with different laws of development. Therefore, socioeconomic policy should also be our own, Russian policy.

### 1. We Have Something To Preserve

Recently for the first time in the country an appraisal with the participation of 270 most prominent domestic scientists—members of the Russian Academy of Sciences—was made by associates of the Central Economic and Mathematics Institute of the RAS [Russian Academy of Sciences]. Each of them presented forecasts of the possibilities of the development of his field of science and technology for 10-15 years. The appraisal shows that there are a large number of such directions of science and technology, which fully correspond to the world level. It is necessary to preserve them first of all.

As for technologies, defense technologies are in first and for the present the leading place. The significant scientific reserve and the numerous collectives of highly skilled scientists and engineering and technical personnel of the defense industry are making it possible to be quickly integrated in the world economic system on the basis of the export of arms and conversion products and technology. The development of defense technologies, and this is their advantage, depends to the least degree on the import of licenses, know-how, components, and final products.

The conversion of defense sectors of industry will have a considerable effect on the development of many science-intensive directions. It is worth mentioning just a few of them:

**laser technologies**, in which many domestic developments have priority; and although the importing of technology may be required, while in some cases joint ventures should be established, the experts forecast the export of a fairly large number of licenses, know-hows, and technologies;

**space technology and civil aviation**, in which it is possible to count on the significant export of final products and technologies, especially if efforts are combined with foreign partners and joint ventures are established;

**powder technologies**, in which the significant export of licenses and know-how, final products and technologies is expected;

**composite materials**—a significant scientific reserve, which makes it possible to hope that by 1996 the significant export of final products, technologies, licenses, and know-how will become possible, exists here.

At the same time conversion cannot cure all the troubles of our economy, as it seems to many economists. Due to

the difference of the technologies of the defense industry from those used in the civilian sector its results will be significantly less perceptible and, apparently, will not be able to govern scientific and technical progress in a number of science-intensive technologies that are important for the country. First of all this applies to biotechnology, health care, the medical, microbiological, chemical, and petrochemical industries, the processing of secondary raw materials, and components for radio electronics and computer technology.

The second area, which merits increased attention and has a rather high export potential, is power engineering technologies, the development of which is also closely connected with the conversion of the defense industry. Let us note just two directions.

First, nuclear power engineering technologies. In spite of the fact that for the realization of one-fourth of the forecasts it is necessary to use foreign know-how, in the future owing to the mighty production potential of the sector, in cooperation with leading foreign firms, it is possible to count on the significant export of new technologies.

Second, thermonuclear power engineering. The degree of scientific elaboration of the problems here is very high. In this area a sufficient number of highly skilled scientists are employed and there is a significant scientific reserve, moreover, all the forecasts are oriented toward the use of domestic achievements and the results of the conversion of the defense industry.

The third area is the production of intellectual products, particularly software, and the obtaining of results of scientific research and development, many of which can become an export item.

Finally, it is possible to single out a number of technologies of the raw material complex, the development of which will make it possible to increase the level of recoverability of natural minerals and to expand the use of secondary resources.

The role of some of these directions in the economy was always significant. Thus, in the export of machine building products the share of power equipment and aircraft alone came in recent years to 25 percent. The export of arms reached in the late 1980's \$12-14 million in 1985 prices (although it is necessary to adjust the indicated figure with allowance for the fact that the country actually received not more than 30 percent of this sum). One should also add to these items of export mass-produced durable consumer goods, which are produced at enterprises of the defense industry (televisions and radio receivers, refrigerators and washing machines, and others) and which, in spite of a relatively low quality, were able to stand up to competition on the markets of East European countries.

Of course, in our country significant "gaps" exist in the science-intensive sector of the economy. Apparently, for some of these directions the principle of the complete

demolition of an old works and the building of a new one is actually best suited of all: We, for example, are 10-20 years behind the most developed countries in the area of informatization, 10-15 years behind in the technology of producing semiconductor devices, 10 years and more behind in robotics and alternative energy sources; the lag in the technology of oil production and refining is estimated at 20 years, and so on. The state of affairs is most serious in high technologies, which govern subsequent scientific and technical progress in the country: First of all, these are radio electronics, components for radio electronics and computer technology, computer technology, communications equipment, scientific instruments and equipment, and transport. The elimination of the significant lag in these areas is impossible without the importing of technologies. For the development of a large number of other directions it is sufficient to import licenses and know-how. Among them are steam-gas installations and transport, scientific instruments and analytical equipment, software, thermal power engineering, and the fuel industry.

## 2. Foreign Experience Confirms: It Is Necessary To Revise Policy

The adverse effect of shock therapy (at any rate at the first stages of reforms) on scientific and technical progress, particularly its priority directions, is well known.

The example of Poland shows that without a scientific and technical policy and an investment policy and without the prepared putting into effect of all market mechanisms after the completion of "shock therapy" inflationary processes resume. The steps on the restriction of the effective demand of economic organizations and the population led in Poland to the sharp decrease of production investments. As a result the share of new types of products in the volume of sold products decreased in machine building to one-half. Obviously, a set of precisely formulated steps of the economic stimulation of the priorities of socioeconomic and scientific and technical development is necessary.

Second: One should not expect an influx of foreign capital and technologies until the necessary guarantees and preferences, which offset the risk due to the inadequate stability of the political situation, are provided.

The basic levers of the stimulation of the influx of foreign capital in priority directions are: the assurance of the domestic convertibility of the national currency, the abolition of restrictions on the share of participation of foreign capital in the management of enterprises, tax credits for joint ventures, preferences for foreign firms, which contribute to the development of export works in the country, customs privileges and the equation with foreign investors of citizens who work abroad.

For example, the legislation of Hungary envisages substantial tax credits for joint ventures in priority science-intensive directions (electronics, pharmaceuticals and means of plant protection, material- and energy-saving

technologies, biotechnologies, machine tool building, transport machine building). In these sectors enterprises, starting with a specific amount of capital, are exempt from the profit tax for five years and receive a credit of up to 60 percent for the next five years. From the experience of Yugoslavia the encouragement of long-term (not less than three years) cooperation agreements, if they contribute to the development of export works, is interesting. For the attraction of the capital of citizens, who work abroad, in case of the investment of assets within the country customs privileges were granted to them there, and they were made equal in rights with foreign investors. Thereby favorable conditions are created for the development of private business at a comparatively high technological level.

Third: the necessity of a cautious attitude toward the admission of foreign capital to the domestic market. The liberalization of the importing of foreign capital should be accompanied by the elaboration of special steps on the protection of national sectors against the excessive competition of foreign products and technologies on the domestic market.

In contrast to the countries of Eastern Europe we, apparently, should not fear that given the present exchange rate the domestic market will be completely closed to western goods and our enterprises will go bankrupt, since their products will not be competitive. Obviously, we should learn to use one of our as yet main advantages in competition with foreign partners—cheap and at the same time fairly skilled labor. Our products for a long time to come will hold on the domestic market the niche of inexpensive goods of not very high quality, the demand for which will remain given the relatively low level of the average per capita income. The sectors of heavy industry, which produce materials-consuming products, as well as a number of large-tonnage works will also remain competitive. At the same time customs policy should be flexible: If an imported product, first of all from developing countries, proves to be cheaper, protectionist measures are necessary.

Fourth: Privatization should be well thought out and well-prepared. In practically none of the countries has privatization been completed. Even in Czechoslovakia, where the state of the economy is fairly stable, significant differences with regard to accelerated privatization exist. In Poland and Hungary privatization is being carried out fairly cautiously and, therefore, slowly. It is possible to expect that under the conditions, when the political situation has not stabilized, the commercialization of state scientific production associations and enterprises with their simultaneous transformation into joint-stock companies, which has been planned in our country, will promote the greater decentralization of management and can complicate the implementation of state scientific and technical policy.

Large enterprises that are monopolists require special attention. They are more safe owing to assistance on the part of the state, which is guarding against social



upheaval, and at the first stage of stabilization do not fear bankruptcy, keeping their balance on the brink of unprofitability. This means that existing large enterprises are farthest from the market system and their rapid privatization will not solve any problems.

The example of one of the largest monopolists—the Kama Motor Vehicle Plant, which was transformed back in 1990 to a mixed-type joint-stock company—is typical. The plant was able to ensure a profitability of products at the level of 15 percent, having increased the price of the base model to nearly 500,000 rubles, but then was transferred to the card file due to the fact that the consumers of its products were unable to pay for them, while the extension of credit for deliveries of raw materials and components was halted. Here the demand on the part of agriculture decreased to one-fourth. Obviously, a gradual privatization program, which is designed for many years and should start with the service sphere and agriculture, is necessary.

Fifth: It is possible to conclude that the transition to a market and stabilization measures should be accompanied by the formation of a special infrastructure for the support and stimulation of innovations, as well as by greater concern for basic science.

The orientation toward short-range goals is leading to the support of applied research and development in directions, in which the rapid recoupment of expenditures on science is expected. In particular, in Hungary a specific system of the support of applied research and projects, which promise rapid recoupment, is beginning to be formed. Innovation banks, which specialize in sectors of the national economy, have been established. For enterprises, which introduce scientific and technical achievements, customs and tax benefits are provided and accelerated depreciation is permitted. In Poland due to shock therapy a stable system of the support of science thus far has not been established, and this has led to the serious drain of specialists and the collapse of a number of research organizations and to the halt of a number of basic research projects. It should be noted that such a situation may prove to be particularly dangerous for Russia, where basic science traditionally had priority, being a most important component of national culture.

Thus, the successive implementation of a large number of interconnected measures is required for carrying out the least drastic version of the stabilization of the economy. The future of domestic science, engineering, and technology depends in many respects on how we succeed in accomplishing this.

### 3. The Criterion Is the Minimum Losses

From the level of political disputes about the expedience of the restructuring of the economy it is necessary to proceed to the selection of a specific optimum means of changing over to a market. The problem consists not in doing this as quickly as possible, but in preserving all the best that the country has accumulated over the long and difficult path of its development. Consequently, not the

transition to a market in the shortest time, as some foreign advisers insist, but entry into the market economy with the minimum losses for Russia, should be the main goal. The second thing is the gradual nature of the transition, an orientation toward the long duration of the processes of liberalization and privatization, the demonopolization and demilitarization of the economy.

The reorientation toward the transition to a market with the least losses entails at the initial stage the enhancement of the role of centralized management, the abandonment of the absence of a budget deficit, privatization that has been prepared in advance (perhaps even with the preliminary nationalization of recently formed associations and enterprises of the base sectors of industry), the establishment of an actually functioning tax system, the putting into effect of a law on bankruptcy with guarantees of the minimum social protection of the population, the deferment of the payment of the foreign debt, and strict customs restrictions on the export of strategically important high-quality material resources. Finally, the introduction of the world practice of accounting and the keeping of statistics is necessary.

The question of the proposed increase of the role of centralized management may arise. But the experience of both "old" developed and new industrially developed countries, such as South Korea, Taiwan, Brazil, and Singapore, underscores the great importance of the implementation by the state of resolute and dynamic measures, which also led there to the substantial acceleration of the pace of scientific and technical progress.

What should our state do?

First of all it is necessary to formulate a political strategy of Russia, having specified for the long-range future the interrelations with the basic partners—the United States, the European Community, Japan, and China—as well as to define more precisely military and defense doctrine.

Then it is necessary to specify the socioeconomic reference points for scientific and technical progress. The analysis shows that during the period of economic recession and hyperinflation they are:

the maximum use under the conditions of investment limitations of the available reserves of material resources for the offsetting of the shortage of raw materials, materials, and foodstuffs and the elimination of the consequences of the production slump; the reduction of the losses of raw materials and products;

the qualitative improvement of the production potential of raw material sectors—the basic exporters of raw materials and materials and sources of convertible currency assets;

the optimum use of the resources of the defense industry complex, the stimulation of the development of works that are capable of exporting products, including weapons systems.

Then it is necessary to determine the priority directions of scientific and technical policy at the initial stage of the changeover to a market system. The results of the work of a large collective of scientists and specialists showed that it is possible to single out in order of importance three groups of priorities:

directions, the development or preservation of which is most important for the country under the conditions of the crisis of the economy and which are a source of currency resources—conversion and the stimulation of the development of export works of the defense industry; the increase of the technical level of the primary units of the technological structure of the economy (the extraction and processing of products); the preservation of the potential and the further development of domestic science, first of all basic science, as the most important component of national culture, the stimulation of the export of intellectual products and services;

directions, the development of which is connected with the progress of the priority directions of the first group and in many respects depends on the availability of currency resources and the preservation of the achieved scientific and technical potential—the development and production of medicines and drugs; the material, technical, and information support of the transition to a market economy; the implementation and stimulation of measures that prevent the worsening of ecological conditions;

long-range priorities, which should also be taken into account when selecting the directions of scientific and technical policy—the increase of the quality of foodstuffs, the elimination of substances and food additives, which are bad for the health, the meeting of the need of the population for protein products, the assurance of the stability of agricultural production, the improvement of the health of the population, the increase of the quality of the diagnosis, prevention, and treatment of diseases, the improvement of ecological conditions, the development of science-intensive works and technologies, the informatization of society, the improvement of the quality of education and personnel training, the development of transportation and communications, the strengthening of the defensive capability of the country on the basis of the principle of reasonable sufficiency.

Finally, it is necessary to develop a system of the implementation of the priorities of scientific and technical policy and investment policy, to select and to determine the level of the necessary stimuli and prohibitions. All this should find reflection in the law on scientific and technical policy.

#### 4. The Immediate Prospects

For the short-range future it is important to specify the priority directions as clearly as possible.

If we talk about the conversion of the defense industry, then, as the analysis shows, the basic one, from the standpoint of carrying over experience from the defense

sector to the civilian sector, is the development of directions that are characterized by the output of a specialized small-series or single-design product that involves the development of new materials and technologies and the making available of services of a specific purpose.

First of all there should be singled out among them:

space hardware, passenger and cargo aircraft and engines for them, special types of transportation, including for the northern regions of the country and difficult transportation conditions, special-purpose passenger and cargo ships;

nuclear power plants, gas-turbine plants for power engineering, compressors for gas pipeline transportation, drilling equipment;

new materials and technologies;

specialized very large-scale integrated circuits, computers, software packages, control systems;

special and single-design scientific instruments with the use of the achievements of basic science;

the making available of services for the putting of scientific equipment into space, the transportation of cargo by air transport, and the fulfillment of other similar tasks.

The choice of priority technologies in the **fuel and energy complex** should take place with allowance for the possibilities that are being afforded in connection with the conversion of military production, international cooperation, and the attraction of foreign capital. The analysis and formation of public opinion become very important when developing "breakthrough" technologies that are proposed for large-scale use. With allowance for this four basic priority directions of scientific and technological development should be distinguished: the development of oil fields with complicated conditions of recovery, stationary gas-turbine and steam and gas power plants, nontraditional renewable energy sources, safe nuclear power plants.

The **reduction of the losses of agricultural raw materials** and foodstuffs to a significant degree depends on the introduction of advanced technologies and the increase of the capacities of the processing and storage of products. The development of technology for small works and the production of equipment for farms should be stimulated. The lag of domestic machine building for light and food industry and the lack of experience in the development and production of equipment for the processing of agricultural products predetermine the special role of the importing of new technologies. Foreign equipment and technologies are required for practically all directions of the processing and storage of agricultural raw materials.

In the area of **secondary resources** during the period of the reduction of production and the curtailing of investment activity the priorities will belong to noncapital-intensive technologies of the processing of two groups of resources:

ones that make it possible to free or to offset the shortage of valuable primary raw materials and materials (recycled polymer raw materials, waste paper, recycled textile materials, spent petroleum products, tires, and rubber items);

the waste of large-tonnage works—first of all the chemical industry (phosphogypsum, pyrite cinders), ferrous metallurgy (slags of metallurgical and ferroalloy plants), the pulp and paper industry (sulfite liquors, lignin), the ash and cinders of thermal electric power plants.

The development of the production of **consumer goods** continues to determine the possibility of changing the labor motivation of the people employed in the national economy. Here, following the liberalization of prices, the saturation of the market with goods, which are accessible with respect to price to broad strata of the population, is the main condition.

The significant increase of the production of passenger cars, primarily inexpensive models like the "volkswagen," is one of the most important points here. For this it is necessary to use the capacity of the defense industry and agricultural machine building, as well as to attract foreign investments for the construction of motor vehicle plants, including assembly plants. The temporary restriction of the export of passenger cars, which came in 1990 to 40 percent of the total output, if only to the level of the mid-1980's (about 25 percent) should become one of the reserves of the increase of their sales volume on the domestic market.

The production of agricultural machinery and equipment for leaseholders and equipment for the cultivation of private plots should also be priority.

## 5. How To Implement Priorities

First of all one should see to the preservation of domestic science, first of all basic science, as well as the potential of the defense industry.

It is necessary no matter what to keep the budget financing of science if only at the level of the last two to three years, that is, to maintain the share of state spending on science at the level of about 2.5 percent of the national income. Apparently, it is also necessary to try to maintain until the stabilization of the economy the organizational structure of science, taking into account that in case of any reduction or shutting of scientific research institutions the best scientists suffer first of all.

In the defense industry it is necessary to devote basic attention to the preservation of formed collectives. The reduction of military production should be gradual and should be offset if only in part by a state order for

complex specialized civilian equipment, in exactly the same way as was the case with military hardware. Perhaps, at the first stage in connection with this even some increase of the budget deficit will have to be tolerated.

At present it is possible to count on a significant influence of three types of tax credits (for investments in new capital in priority directions, the deduction of expenditures on research and development from the revenue liable to taxation, credits for the profit, to include small enterprises). In turn, for investment credits lists of types of equipment, technologies, and materials should be drawn up in accordance with the state system of priorities. The granting of credits on easy terms is necessary for the increase of the demand for the results of scientific research and development, especially for the stimulation of already available developments.

Under the conditions of the shortage of currency assets the preferences to priority directions of scientific and technical progress should be accompanied by strict state restrictions (high customs tariffs, licensing) on the importing of raw materials, materials, and final products for directions that do not enjoy priority.

Thus, today an entire set of interconnected, centrally managed measures and the revision of the entire scientific and technical policy are required in the country.

The market is not an end in itself, but merely a new stage of the development of the economy, and it is necessary to enter it, having preserved the national wealth—the scientific and technical potential of the great Russia.

## Controversy Surrounds State-Controlled Innovation Fund

### Lebedev Criticism

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[Interview Yuriy Lebedev, chairman of the Innovation Committee of the Russian Federation, by Valeriy Kamnev, under the rubric "Innovation Policy"; date and place not given: "The Fund That Survived"—first two paragraphs are *RADIKAL* introduction]

[Text] Mortgage is another new-fangled word which, one must suppose, very soon will take root in the Russian language, as "liberalization," "privatization," "consensus," "summit," and "official distributor" have taken root. It means "a lien"—under our conditions, as it turns out, a great thing.

In any case, owing precisely to it the Russian Innovation Fund (RIF) survived and, we will hope, will survive. It survived, in spite of a large number of obstacles and the infamous scandals that accompanied its two-year existence, in spite of the undisguised nonacceptance and distrust of government leaders, on whom its existence in many respects depended.... It not only survived, it also earned decently—it turned the 75 million, which the

state allotted it, into 1.5 billion. Moreover, it not only earned well, it sees in its innovation policy a model, which, it appears, will be able to get Russia out of the new economic disruption.

[Lebedev] Our misfortune and our only hope are that we have a very large amount of state property, believes Yuriy Lebedev, chairman of the Innovation Committee of the Russian Federation, the organization, under the jurisdiction of which the RIF is. This is the only valuable that our country has today.

I do not mean the slow privatization of the greater part of state property. I do not believe at all in wholesale privatization—it in any case will end in the same kind of wholesale nationalization, since people will begin to turn over to the budget what does not yield income. I have in mind the opportunity to mortgage this property, an opportunity that appeared with the appearance in Russia of the lien.

In our country there are two types of state property—federal property, which is managed by the Russian government, and municipal property, which is managed by regional authorities. The combination of these two types of property can determine the policy of the interaction of the leadership of the Russian Federation with the regions. We offer for this a practicable mechanism, in which everything proceeds from the goals, from the priorities.

Now throughout Russia there is common trouble, but in each region it has its own features. In this place there is a catastrophic shortage of housing, there—of food, and there—of some consumer goods. We have agricultural regions, we have raw material regions, we have industrial regions, everywhere there are a large number of misalignments, everywhere everything has been mixed together in the craziest way, and that is why only the regions should decide what is of priority for the given specific area. Let all of them determine their priority policy and suggest to the Russian government a plan of their own development and, thus, the development of all of Russia. It, in turn, determines the common priorities for everyone, forming in this way its own priority policy, but, taking it into account, interacts with the regional government and organizes the interaction of the federal and regional property that exists there.

Such a thing is impossible, if we place the emphasis on state enterprises—we have already gone through this. Only the state joint-stock company or, as they still call it in the West, the limited partnership can be the most important and only possible element of the economy—precisely now, during today's transition period.

The state calls the tune here. It does not give money, the state simply does not have it—it allows the partnership to mortgage state property. The money of the partnership is formed of the money, which was received on the security of state property, and of private capital, which was invested by those who are interested in the development of a given state program. Moreover, private capital

is interesting not only and not so much in itself as capital attracted for the accomplishment of an important matter—its main value lies elsewhere. In contrast to an official, who in case of the failure of a project risks only his good name, a private investor also risks his own money and will never give consent to a step that to him seems unprofitable. Therefore, private capital is important here as an indicator of the effectiveness of a program—precisely with his assistance the mortgaged property will be used in the best way.

[Kamnev] But, pardon me, from what direction is the Innovation Fund coming here? After all, mortgage legislation appeared in Russia comparatively recently, while the fund has already existed for two years, moreover, as far as I know, it is not at all a limited partnership, but a state organization....

[Lebedev] All this is true. But in 1990, when the RIF appeared, it could not but be a state organization, no one at that time had even thought about state joint-stock companies. As to the lien, at that time it actually did not exist, but we got a special decree of the government, according to which we acquired the right in case of the failure of a program to sell by auction the state enterprises, which wanted to participate in our programs and voluntarily transferred to us.

The innovation business is a very profitable and very risky venture. In the United States, for example, the situation, if of 10 programs eight fail, is considered normal. We could not afford such a luxury, we were forced to work under conditions when not one program fails. Otherwise they would have simply swallowed us up—we had too many ill wishers, they looked too askance at this form of work, in case of which private capital fuses with state capital, supposedly creating new opportunities for corruption. Over the two years eight high commissions inspected us, and the only result of the inspections reduced to the fact that the state joint-stock company is operating very efficiently....

[Kamnev] But was the fund a state organization and did it remain a state organization? What do state joint-stock companies have to do with it?

[Lebedev] But I am not talking about the fund, I am talking about programs. We were the first in practice to begin giving our programs the status of a legal person. But these organizations were formed after the pattern of state joint-stock organizations.

[Kamnev] And how are such programs established?

[Lebedev] First a team—those who formulated the program and are prepared to fulfill it—is put together. Then in the Innovation Fund the program undergoes a twofold examination—independent and state—of the departments which on behalf of the state acts as full members—the State Committee for the Management of State Property, the Ministry of Finance.... If the opinions of the experts coincide, we begin to check this program in earnest—we look at marketing and the economics, we

look at the extent to which the obtained commodity satisfies the requirements of the western market, we check whether the program is capable of yielding a profit in two years. The last is important for the extension of long-term credit.

Further. After approval we send the proposals to the government, and after these proposals have been accepted by it, a board of directors of the program, to which representatives of all the organizations that are investors belong, is set up. But the main say and the right to veto are reserved for the full members who are the representatives of the state.

The fund in this case acts as an insurance company—it guarantees bank credits with the value of the state enterprises that are under its jurisdiction. But inasmuch as with the fulfillment of a program the accumulation of capital and the gradual repurchase of property from the state take place, the fund has another function—a holding function.

The Innovation Fund has three types of activity—state programs, its own programs—lower in status—and commercial activity, which is aimed at supporting innovation activity. In two years we have seen to it that here 16 innovation programs are operating efficiently, a number of other programs are being established.

Thus, now the representatives of practically all Russian motor vehicle plants are busy with establishing a program on the production of sodium sulfate batteries—they are needed for the normal operation of ground transport—and a program on the production of an ecologically clean motor vehicle.... In the next few days a meeting of representatives of the administration of small cities is being held—the program “The Revival of Small Cities of Russia” is being prepared. For small cities this is salvation—now no one will provide money for restoring their central parts and for bringing them into a normal state. In each city, which wishes to participate in this program, we will set up a separate state joint-stock company which will deal with insurance and investments in construction, in modernization....

And, finally, it is impossible that everything would be confined to Moscow and in two years an entire network of regional funds would be established.

Of course, the work would have proceeded far more efficiently, if the Innovation Fund were not a state organization, but a state joint-stock organization. We have been trying for five months to obtain a government decision in this regard, we have camped on all the doorsteps, at every level it is necessary to prove the same thing many times and, in spite of the opposition, we have already convinced many people.

### Fund Director Responds

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17 Jul 92 p 2

[Interview with Viktor Vladimirovich Marushchenko, general director of the Russian Innovation Fund, by *RADIKAL* commentator Marina Lapina, under the rubric “Innovation Policy”; date and place not given: “Two Heads Are... Worse Than One”—first paragraph is *RADIKAL* introduction]

[Text] The innovation policy of Russia could have been far more successful, if it were not for the scandalous situation with the Russian Innovation Fund, which has gone on for more than a year. Our commentator Marina Lapina talks with Viktor Marushchenko, general director of the Russian Innovation Fund.

[Lapina] Viktor Vladimirovich, when we were making arrangements with you about a meeting, you recalled the interview published by us (see *RADIKAL*, No 12 of this year) with Yuriy Lebedev, chairman of the Innovation Committee of the Russian Federation, in which the activity of the fund was presented, as you expressed yourself, in a false light. What specifically do you mean?

[Marushchenko] In his interview there are sheer lies. The first lie consists in the fact that the fund survived not owing to, but in spite of the activity of Mr. Lebedev. The second lie. There are no 1.5 billion in the fund. People have been calling me and asking: “If you have such money, why are you not extending credit for programs? Yet such money does not exist. But I cannot be responsible for the publications of other people.... And so on.

[Lapina] Have relations not formed between us? Or is it again a conflict of executive and legislative power?

[Marushchenko] But you will recall Trofim Denisovich Lysenko. Here is a typical example of Lysenkoism. New ideas arise all the time, but it is somehow not obligatory to implement them. If you would like to see if only one standard document, which was drafted by the Innovation Committee and was accepted for implementation—and this is its main function as an expert analytical organ—I am prepared to make you lose each quarter a bet of a case of cognac. There has not been one such document in the two years of activity of the committee.

If some documents were accepted, they were drafted in a completely different place.

The committee, which Lebedev represents, is an invented unnecessary structure. Can I now deal, for example, with innovations in the area of journalism or printing activity? No. I am not a specialist. I can only deal with the mechanism of the promotion of the implementation of programs, general methodology, the financing of individual programs that have been evaluated by experts. But to establish in each direction new programs and projects is the immediate function of the Ministry of Science, the Higher School, and Technical

Policy, which is specified by the ukase of the president. Here there is an attempt to make for oneself a sinecure.

[Lapina] Let us all the same examine how the fund and the committee emerged. What are their functions? Who actually deals with questions of the innovation policy of Russia—you or Lebedev?

[Marushchenko] The fund is an executive structure of the government. Its task is the preparation of government programs and projects with local organs of power. For example, regional or goal programs in various directions of science and technology, including the determination of the specific performers. We should promote the introduction of the achievements of science and technology and implement the mechanism of the state support of scientific achievements.

Today we are dealing with two types of programs: state innovation programs, which have been approved by the government, and enterprising programs.

We divide the assets that we have in the following proportion: 85 percent for state programs, 10-12 percent for enterprising programs. The rest is spent, roughly speaking, on the cost of operations.

[Lapina] Let us specify what your budget is.

[Marushchenko] We do not get anything from the state budget. We, like any newly established state organization, received base capital, rather, working capital—75 million rubles [R]. This is the authorized capital stock, but actually the working capital, since a source of its replenishment in the form of deductions from the profit after the implementation of programs is envisaged.

The necessary amount of financing of the accepted state innovation programs is about R2 billion. In all there are 17 such programs. They began to be implemented roughly in September of last year.

We also attract the assets which were obtained from the commercial activity that the fund performs. According to the charter it is permitted, but we can use the revenues from it only for prescribed activity.

The payments to the fund from October of last year to the present came to about R60 million. By the end of the year, according to our estimates, about 40 million more will be paid.

All this is obviously insufficient. Therefore, another mechanism of the formation and financing of programs has already been envisaged.

Earlier we were granted the right to issue guarantees on the security of federal property. This statute was drafted more than a year after the appearance of the decree on the fund, therefore, it could not be implemented. We issued guarantees against our own assets, which for us is very unprofitable, inasmuch as if I issue a guarantee for a specific amount, it is blocked in the account of the fund, while the bank receives interest on the extension of

credit, actually using the assets of the fund. It is more profitable for the fund itself to give credit, moreover, at a favorable rate. To give credit on the security of federal property—such a mechanism, I think, will be effective. Precisely now the standard documents are being drafted.

[Lapina] Who are your investors, whom can you attract today in this capacity?

[Marushchenko] I will be frank. We can attract today any investors, inasmuch as it is very profitable to make investments in the fund—they are not taxed. But due to some uncertainty with the structure of the fund and with the relations between the fund and the innovation committee and due to the fact that Mr. Lebedev considers himself to be the chairman of the fund and is engaging in direct interference in its activity....

[Lapina] I do not entirely understand what he considers himself means....

[Marushchenko] I can show you a document that confirms that he actually appointed himself president. In the prevailing charter of the fund it is recorded that the chairman of the Innovation Committee attached to the RSFSR Council of Ministers is ex officio president of the fund. There it is recorded that the president is a member of the government, there it is written that the board is approved by the government. The government did not approve the composition of the board. The founders of the fund—the State Committee for the Management of State Property and the Ministry of Finance—did not make the decision that Lebedev is the president. He appointed himself....

[Lapina] ???

[Marushchenko] There are the minutes of the meeting of the founders with the signature of Lebedev concerning the fact that he was appointed president, but the signatures of the founders are not there. This is illegal. Moreover, antimonopoly legislation, according to which personnel of organs of state power and administration cannot hold posts in structures that are connected with the distribution of assets, also exists, and there is the ukase of the president on corruption, which also prohibits such activity. But Mr. Lebedev distributes assets, signs financial documents, personally disposes of the assets at the bank, and so on.

[Lapina] Pardon me, but what, then, are your functions?

[Marushchenko] We are the board of directors of the fund, which should also do all this. Lebedev tried to take these rights from us. Last year we had a very serious confrontation, when Lebedev tried to turn the fund into a state commercial corporation. State bodies of administration—the Ministry of Finance, the State Committee for the Management of State Property, and the Ministry of Foreign Trade—would be responsible with respect to the liabilities of the fund, while mainly private entrepreneurs would derive income.

Today our founders have decided to put the activity of the fund in order, to carry out its reorganization, and to eliminate all these "injustices." We looked into this question for a very long time. For our collective had appealed to the Supreme Soviet, directly to Khasbulatov, to make inspections and to establish order. The collective of the fund unanimously expressed a lack of confidence in Lebedev. This was on 18 September of last year, when at a meeting of the collective he told about his position. He is a people's deputy.... The innovation council headed by him in December of last year was eliminated as superfluous. But in January it like the Phoenix was reborn under the Supreme Economic Council of the Supreme Soviet. While on 9 June of this year Lebedev submitted documents to the government on the establishment of the Innovation Committee under the government.

[Lapina] But the government in the person of if only two ministries, which are founders of the fund, should have already understood the situation.

[Marushchenko] Yes, but I cannot blame anyone here. So many problems had been dumped on the government. It did not have time for this. Honestly speaking, during this period we also did not insist on the taking of steps, especially as the control inspectorate of the administration of the president was dealing with the question. But inasmuch as it is not authorized to carry out liquidation measures, it passed the materials of the inspection through all the stages—to the procuracy of the Russian Federation. While Lebedev organized the inspection of individual questions of the activity of our fund with the help of the Ministry of Finance and sent the inspectors to our board of directors. Incidentally, I did not say that he set up another board of directors in October of last year. When the collective expressed lack of confidence in him, he took from us the right to use the account at the bank and changed the signature card, the general director and the chief accountant lost the right to sign at the bank.

[Lapina] And is the parallel board working to this day? Thus, does the fund have two boards of directors?

[Marushchenko] Yes. It is this question that we directed to the Supreme Soviet and other organs of power. Moreover, Lebedev illegally made a duplicate of the seal of the fund, the original of which up to now is here.

[Lapina] And what is the fate of the materials that were turned over to the procuracy?

[Marushchenko] As far as I know, the procuracy asked the Ministry of Finance to look into this. Gaydar supported this decision: to send the inspection to the board of directors of the fund. I will note: No one ever inspected the Innovation Committee. Now this inspection, thank God, is under way.

[Lapina] Of both boards of directors?

[Marushchenko] Yes. This is the second complete inspection. The control inspectorate conducted the first

one, but from the results of its inspection they were never able to make a decision, although the commission had its own findings and conclusions.

[Lapina] But do you suppose that after the inspection your board of directors will be dismissed, while Lebedev will continue working?

[Marushchenko] No, from the results of our activity of previous inspections I am certain that precisely we will be working. The other board of directors, I think, will be eliminated. I do not ascribe this to the people who work there, I actually do not even know them. But the existence of two boards of directors in one organization is nonsense, which does not have analogs in the world. By the way: When the first inspection began, Mr. Lebedev quickly distributed credits of more than R20 million, moreover, among such directions which, in my opinion, do not deserve a ruble. These assets will not be returned.

[Lapina] Let us talk about the substantive aspect of your activity.

[Marushchenko] Let us. Only I would like to emphasize that the founders, the composition of which, incidentally, will be expanded, made the decision on regulating the activity of the fund in accordance with prevailing legislation.

Our largest investor is the Ekorambus Corporation, which paid R50 million into the fund, there were contributions from the Tseolity Corporation and the ASKO Insurance Company, there was the mutual exchange of contributions with a Russian innovation concern, but these were much smaller investments.

We have interest on credits, although very low interest—from 6 to 15 percent per annum. And we are also receiving revenues from commercial activity. Due to the formed situation I did not have the moral right to attract other investors, including foreign investors: I should give them not only material, but also moral guarantees.

We are establishing branches of the fund in various regions of Russia: in Perm, St. Petersburg, Pskov Oblast, and Khabarovsk Kray. These are independent legal persons, from whose activity we do not have any revenues. The branches can exist as organizations of different types depending on the specific nature of the region, for example, even as a joint-stock company. Moreover, we have established an independent structural subdivision, which does not have the status of a legal person, jointly with the Ministry of Defense, which is busy with the study of projects on conversion.

An innovation center, which was established jointly with the Moscow State Technical University imeni Bauman for the implementation of their developments, is already operating. This is a closed joint-stock company. It is operating very successfully, and at the Moscow State Technical University they have already felt this. We will establish a similar subdivision with the University of Friendship of Peoples, documents have been signed with

the Moscow Aviation Institute, special innovation subdivisions have been established with a large number of organizations of the Russian Academy of Sciences.... All these institutes and institutions are first of all the largest expert centers, the specialists of which we are enlisting for participation in and the evaluation of projects.

[Lapina] Everything with the state innovation programs is more or less clear. How do you work with enterprising programs? Do you examine all the proposals? Can you give your whereabouts for those who do not know about the existence of your fund?

[Marushchenko] Yes, we examine all the proposals, which are received both from organizations and from private individuals, conduct an examination, and form a package of proposals for their subsequent implementation. Out of 200 proposals we select approximately one. In general, in my opinion, the innovation fund should not deal with enterprising projects. Subdivisions locally should do this. They know their own specific nature better. We are willing to help organize examination and to provide financing.

As to our whereabouts, when we have carried out the reorganization of the fund and standard acts have been written, we will provide all the information. And in your newspaper first of all. We will publish the procedure of the submitting of proposals and their acceptance, the possible terms of financing, and so on.

The formed situation has bound our hands. I will cite an example. The gentlemen from the Innovation Committee published in the newspaper, in my opinion, *BIZNES I BANK*, a list of state innovation programs, which the editorial office is using for commercial purposes: They collect R10,000 each for the examination of programs. I consider this decay. I can familiarize anyone with a program. For the goal is to attract people. But to collect from them money for familiarization with a program, which is set forth on five sheets of paper, is the discrediting of the activity of the fund. The editorial office has actually been given the right to sell materials. We were outraged and wrote the editorial office the appropriate letter. The publications seem to have stopped. But we do not know whether they will continue to peddle programs.



### Ukrainian Scientists Polled on 'Brain Drain'

927A0271A Kiev GOLOS UKRAINY in Russian  
8 Aug 92 p 2

[Article by Petr Romanyuk, senior scientific associate of the Institute of World Economics and International Relations of the Academy of Sciences of Ukraine, and Igor Zhilyayev, chief of a division of the Center of Studies of the Scientific and Technical Potential and the History of Science imeni G. Dobrov of the Academy of Sciences of Ukraine: "Does the Brain Drain Threaten Us?"—first three paragraphs are GOLOS UKRAINY introduction]

[Text] A single panacea for the brain drain during the many decades of the existence of this phenomenon in the world has never been found. The brain drain is a consequence, not a cause. Of what, to be exact? Scientists are discussing this....

The share of the negative attitude is twofold larger than that of the positive attitude—such is the public opinion of the emigration of specialists and scientists, which for a long time has had in the world the name "the brain drain." The number of people leaving Ukraine has already reached almost 100,000 a year, and among them graduate specialists make up more than a third. For the first time in postwar history we have been confronted with this phenomenon on a mass scale. Now it is possible to state that emigration is tending to increase. A year ago among the oblasts of Ukraine in the number of people leaving per 100,000 inhabitants Chernovitsy Oblast led with 625, Zhitomir and Vinnitsa oblasts followed it with 480 each, while among cities Kiev was in first place with 543.

What do you think of specialists and scientists, who have left the country? The respondents last year for Ukraine gave the following response (percent): negative—29, more negative than positive—19, more positive than negative—14, and positive—12 (the rest were undecided).

Is it possible to predict for sure the flow of emigration? The task is a difficult one, if only in that we are not prepared for the analysis of this phenomenon—it seized us suddenly. The second difficulty is that statistics do not record separately such a category as scientists. Thus, it is unclear, what became of the 500 candidates of sciences, who "disappeared" last year from academic scientific institutions, how many of them went abroad, and how many went to work at other organizations? It can be assumed that departure for ethnic reasons (Jews, Greeks, and so on) and social reasons (the worsening of the standard of living and the possibilities of job placement) will increase. Some negative processes will be the cause of the displacement of representatives of science from the places where they work today. Thus, science of Ukraine is already feeling substantial losses due to the decrease of orders for programs, research, and development, which had been financed through the former central budget of the USSR. The financing of science

through the state budget of Ukraine is decreasing, the financing of defense research, the share of which in Ukraine was rather large, has practically been cut off. The development, which was financed through the internal assets of enterprises, which are themselves barely making ends meet, is also in no better shape.

Whatever anyone thought of emigration, it should be acknowledged that the reduction of the elite intellectual stratum of the nation is one of the results of the "brain drain." Second, this is a disturbance of the fixed mechanism of the activity of the collective of scientists, which is disorganizing its activity. Thus, losses due to emigration, to put it mildly, are unpleasant.

Here it is necessary to state at once that a sole panacea for this phenomenon in the world has never been found. How is it possible to avert this danger? Let us turn to the initial experience of our neighbor Russia, which has already incurred losses from ever increasing intellectual emigration. There the National Committee for the Problem "The Brain Drain" has been set up and is working actively. The draft of the State Program for the Regulation of Intellectual Migration, which, in addition to its own measures, envisages cooperation with other countries and international organizations, has been prepared for submission to the government. Perhaps, it is necessary to borrow this.

Our efforts should be aimed at the integration of Ukraine in the developed world system of cooperation, including in the scientific and technical sphere as well. That is, in our opinion, Ukraine needs not a program for combating the "brain drain," but the formulation and implementation of the practical scientific program "The Integration of the Scientific Potential of Ukraine in the World System of Scientific and Technological Activity." With the effective advance toward the ultimate goal of this program the tension connected with the "brain drain" will also abate.

### Aspects of 'Brain Drain' From Byelarus Discussed

927A0283A Moscow POISK in Russian No 32 (170),  
1-7 Aug 92 p 3

[Article by Gennadiy Nesvetaylov, head of the Department of the Sociology of Science of the Institute of Sociology of the Academy of Sciences of the Republic of Byelarus, under the rubric "Mirror": "The Most Exploited Minority. 'The Brain Drain': Economic Flight?"]

[Text] And still well-known western sociologist J. Moreno was right when he wrote in the book *Sociometry*: "The creators of ideas...are the most exploited minority in the world. They are comparatively few, do not form a class.... The vanguard of academic and social science did not have the social tools of offensive and counteroffensive, when there was an extreme need for this."

Here in Byelarus this problem has acquired modern details: the minimum representation of people of science

in parliament, the super saving of budget assets, a low wage. The young generation is choosing business, and science remains without an influx of "fresh blood." The emigration of scientists is becoming a form of economic flight.

What is one to think of this? The international scientific community is gaining by the "brain drain" from the countries of the former USSR. Scientists themselves are also gaining. The countries of the CIS initially are losing, but a future gain looms ahead of them. Institutes are the biggest losers. It is clear that the evaluation of the "brain drain" as a phenomenon also depends on what point of view one looks at it from.

Among the extreme points of view the following one stands out: It is necessary to take pride in the mass departure of scientists abroad. This, they say, is evidence of our high scientific level. For example, about 80 percent of the actively working mathematicians have left the USSR. Consequently, everything here with mathematics is okay. It turns out that it is time in place of the abolished points of socialist competition to introduce promptly the indicator "the number of people who have gone abroad, including forever" and to evaluate according to it the scientific level of institutes.

Intellectual migration as a social phenomenon has thus far been poorly studied by sociologists. According to the data of the Institute of the History of Natural Science and Technology of the Russian Academy of Sciences, up to 80 percent of the respondents at academic institutes want to leave and firmly intend to do this. The data of the Institute of Sociology of the Academy of Sciences of the Republic of Byelarus are different: Sixty percent of the mathematicians, 50 percent of the physicists, and 40 percent of the specialists in information science do not intend to emigrate. This report at a conference of the Academy of Sciences aroused objections of the opponents: The figures, they said, are incorrect, inasmuch as at these institutes everyone who could has already left.

According to the data of M. Urnov (the VTsIOM), emigration sentiments among scientists of Moscow this year are sparse. Only 6 percent in the defense sector and 20 percent in the civilian sector have a "suitcase sentiment." The reasons for departure are the usual ones, which, in the opinion of sociologists, it is impractical to influence.

The responses to the question about the desire to leave to work under contract for a specific period look completely different. Half of the respondents had such an intention. Moreover, the attitude toward leaving depends to no small degree on age: The most potential emigrants of all are among young people, while the most people who want "to leave for a while" are among scientists from 30 to 39 years old.

Society has an ambiguous attitude toward the "brain drain." An all-Union public opinion poll was conducted in November 1991 by the VTsIOM on the basis of a representative sample of the urban and rural population

in 10 republics, including Byelarus. The majority take a negative view of scientists who emigrate. Moreover, the older people are and the lower the level of their education is, the more intolerant they are toward the departure of specialists abroad. At the same time the population unequivocally rejects prohibitive steps to control the "brain drain," which restrict rights and freedoms. Only 28 percent of the respondents in Russia gave "undemocratic" responses. The majority spoke in favor of "increasing the wage for scientists and specialists and creating for them such working and living conditions that they would not want to leave the country." Russian sociologists conclude that even under the conditions of serious economic difficulties society is willing to make certain sacrifices in order to halt intellectual migration.

It is interesting that the attitude of people toward the problem of the "brain drain" is connected with nationality. This is confirmed upon comparison of the responses of, for example, Lithuanians and Byelarusians. Lithuanians are far more tolerant toward scientists who emigrate, while 73 percent of the Byelarusians support prohibitive measures. Ukrainians censure intellectual flight even more, but believe that it is necessary to combat it by democratic methods.

As is known, everything bad comes itself, but it is necessary to organize everything good. A common feature of the problem of the "brain drain" in all the countries of the CIS is the fact that this mess got started in the heart of the USSR, while each republic will have to get out of it independently. Sociologists are proposing a package of practical steps on the regulation of intellectual migration. It envisages, in particular, agreements between the member states of the CIS on the preservation of the common scientific information space, an emergency state program of the direct support of highly skilled scientific personnel and scientific-intensive sectors of the defense complex, significant tax and other benefits for scientific institutions and scientists, and so on. The mechanism of influence may, for example, include the organization of scientific research on the territory of the republics without leaving, but on the orders and with the money of foreign state, public, and commercial structures. This means is very practicable, for as compared with the West we have extremely cheap manpower.

An international intellectual exchange may become an element of the market mechanism of the regulation of migration. The international board of trustees of the exchange should include both CIS and western scientists and entrepreneurs with a good knowledge of international market conditions, while the work of the exchange should be oriented both toward the needs of business and toward international programs of the United Nations, UNESCO, the International Labor Organization, the United National Industrial Development Organization, and other organizations.

The formed gap in the pay of scientists in the CIS and in the West is so large that it will hardly be possible to

eliminate it quickly. It can be a question for the time being only of some lead of the remuneration of scientific labor with respect to the average level in the national economy. Even if additional sources of financing (for example, foreign sources) were to be found, all the same public opinion would not allow the remuneration of labor to be increased sharply, by one to two orders of magnitude.

Unfortunately, in recent times a trend, which has received the name "The Concept of the Survival of Science," which, supposedly, is aimed at the preservation of the intellectual nucleus at scientific institutes, has appeared. But precisely the most creative specialists will not agree to receive a wage (which all the same is much lower than the acceptable level) and not to have the conditions for scientific creativity of real value. Most likely "The Concept of Survival" in its present understanding will preserve precisely that part of the intelligentsia, for which a small wage and much peace are most important of all. Real creators all the same will leave, having added to the ranks of foreign and domestic intellectual emigrants.

From this standpoint it is more important to keep track not of the number of scientists who have left, but of the quality of those who have remained, so that scientific organizations would not turn into preserves for people

without initiative. It makes more sense to allot scarce resources not for the remuneration of labor, but for the material supply of science. The financing of the participation of our scientists in international conferences, exhibitions, and competitions and of purchases of imported equipment and materials is of not small importance.

The survival of Byelarusian science since Chernobyl has been fraught with danger: Social consciousness, which is oriented toward foreign aid, and not toward internal forces, has been forming. Of course, international aid will make it possible to solve a number of urgent post-Chernobyl problems. But it is necessary to realize in time: The West is not a kind uncle who looks after all mankind. The West is first of all individual countries and multinational corporations with their material interests.

But as a whole when evaluating the problem of the "brain drain" it is worth proceeding, apparently, from the formula contained in a report of the Club of Rome: "The brain drain from countries, where these people can be of the greatest benefit to society, to countries, which are already well provided with experienced teachers and capable scientific and administrative personnel, is the loss of the most important resources of 'human capital,' and it is impossible to compensate for this loss."

### International Summer Space, Computer School Opens in Tashkent

927A0275A *Tashkent PRAVDA VOSTOKA in Russian*  
28 Jul 92 p 3

[Article by Sh. Zaynutdinov: "Stellar Heirs"—first paragraph is PRAVDA VOSTOKA introduction]

[Text] The International Summer Aerospace and Computer School for Upperclassmen (MAKSh) has opened in Parkentskiy Rayon of Tashkent Oblast.

In essence this is its fourth season. Let us recall that it began as an oblast school, then became a republic school, while last summer it was an all-union school. In connection with the disintegration of the USSR and with the appearance on the world arena of the new independent states it was of course necessary to change the status of this small academy, at the source of which was a group of enthusiasts, to which Tashkent educators, scientists, and designers, who were headed by Professors Shavkat Vakhidov and Iosif Yakubov, belonged.

There is a reason for the fact that the school is now an international one. Along with the children, who came from Tashkent, Bukhara, Kokand, Kungrad, Mangit, Namangan, Urgench, and Novosibirsk, for the first time children of their own age from Poland and Turkey will begin lessons. Students of the specialized classes with an aerospace emphasis of Tashkent Secondary School No. 37 constitute the main body of the seven symbolic crews. The Republic Foundation of Gifted Children imeni Ulugbek, the Engineering Academy (the section "space instrument making"), the Center of Technical Creativity of Youth, and the Ministry of Education, as well as the aircraft building faculty of Tashkent State Technical University imeni Beruni, the Tashkent Design Bureau of Machine Building, the Kamolot Scientific Production Firm, and the Uzbek-Indian Unitech International Joint Venture were the organizers and sponsors of the MAKSh.

Along with representatives of these organizations and institutions leading scientists of Uzbekistan, specialists of the Tashkent Aircraft Production Association imeni Chkalov, and executives of aerospace enterprises of the countries of the CIS and the Cosmonaut Training Center imeni Gagarin will give lectures and practical lessons.

Pilot-Cosmonaut Vladimir Dzhaniybekov and the young growth of Star City will take part in the work of the school. These are Captain Salizhan Sharipov, who received this spring the diploma of test cosmonaut, and Vladimir Severin, a design engineer of the Energiya Scientific Production Association, who received this spring the diploma of mission specialist.

The upperclassmen will spend two weeks at the Nevuch scientific base, where specialists of the Tashkent Design Bureau of Machine Building usually test out their new developments, instruments, and units, which are intended for the conducting of scientific and practical research on board satellites, spacecraft, and orbital stations. The 16- and 17-year-old boys and girls—Uzbeks and Russians, Koreans and Ukrainians, Turks and Poles—in reality, not on mockups, but on original space hardware and electronic systems will get acquainted with astronomy and celestial navigation, the working principle of trainers, the space motorcycle, the space suit, and advanced passenger and cargo liners. Incidentally, the instructor of one of the symbolic crews, Damir Gizatulin, an engineer of the aerohydrodynamics faculty of Tashkent State Technical University, developed the design of a one-seat light-engine airplane. Its fuselage, wings, and tail assembly, which are made of composites, are ready. Together with his young assistants he intends at Nevuch to set up a jig and to assemble the mini-airplane. Another matter is whether or not the machine will fly. But then the instructor and his students will be convinced of the accuracy of their calculations and possible miscalculations of the steel bird.

The other crews will engage in airplane and rocket modeling, the development of original kites and computer games, invention problems and science fiction short stories, and watercolor paintings on assigned themes. Various competitions for the best design of an extraterrestrial colony, a Martian ship, a planet rover, and other odd machines, special attractions, and instruments are envisaged. In short, the MAKSh will help the gifted young people to make the final choice of the occupation of engineers and researchers in the field of aerospace and computer technology. The perennial question "What am I to be?" will cease to worry these boys and girls owing to the nontraditional methods of instruction, which were proposed by the organizers of the summer school and have been tested out over a number of years.

### Legal Entanglements Complicate Intellectual Property Legislation

927A0269A Moscow RADIKAL in Russian No 26,  
17 Jul 92 pp 9, 10, 11

[Article by Doctor of Economic Sciences Prof. Anatoliy Vengerov: "Intellectual Property: The Legal Tangle of the Present"—first paragraph is RADIKAL introduction]

[Text] For the package of laws on intellectual property, it seems, a difficult fate is forming. Even those of them, which the Supreme Soviet of the Russian Federation has passed, thus far have not been signed by the president of Russia. From the published remarks of the well-known lawyer it follows: There cannot be a different fate.

However strange this will seem at first glance, intellectual property, that is, the ownership of the products of creativity or—more broadly—the results of spiritual production (art works, inventions, discoveries, and so forth), is much more ancient than material property, that is, the ownership of physical assets and the conditions of existence (land, tools of labor, enterprises, and so forth).

An aboriginal youth from some Australian clan could give his sweetheart a song or dance, which was composed by him. And this was considered one of the most valuable gifts. For henceforth the sweetheart herself could sing the song or perform the dance as her own works.

The totem—a consecrated and idealized being-protector—also belongs to some local group or to a specific member of this group and was carefully protected from the uninitiated. The protection of the totem against divulgence, or, as they would now say, the observance of confidentiality, was connected at times with well-being or even life itself.

And what about the rock drawings in the hidden, hard to reach corners of several caves in the Pyrenees, which were used for fertility rites, hunting magic, and initiations? For this is the upper paleolith—30,000-18,000 years ago!

At the same time it must be stressed: A history of intellectual property has thus far not been written.

In our country it was completely buried under the layer of the history of material property, which in the Marxist interpretation of social life was declared the beginning of all beginnings, of all social changes and the nucleus of notorious production relations. Its poor relative—intellectual property—was forced to the fringe of scientific interests, for the most part of lawyers. And of them only a few dealt with copyrights and inventor's rights, which are mysterious for the majority of social scientists, at times without attaching these rights to their real primogenitor—intellectual property.

And suddenly there is an economic legal boom: Everyone has taken an interest in intellectual property

and is demanding its definition and protection. Here one of the spokesmen and chiefs of enterprise, K. Borovoy, exclaims: "The question of a law on intellectual property has been on the agenda a long time—a completely unexpected thing: It turns out that it is impossible on the market without it" (PRAVDA, 23 February 1992). Special structures—the Russian Intellectual Property Agency under the president of the Russian Federation—are also being organized. Gradually a tight, rather intricate knot, which it is also necessary either to untie or to cut up, also sprang up. And the first question arises—Why precisely now?

Values, as is known, are created not in the sphere of exchange and distribution, but in the sphere of production, including spiritual production. And precisely this product in our country became in essence the basis of the shadow economy. Incidentally, the losses from the embezzlement of intellectual property in various forms (illegal duplication, video piracy, plagiarisms, and so forth) in the United States as well come to many billions of dollars. All the more strange, for example, is the statement of B. Saltykov, the new Minister of Science, the Higher School, and Technical Policy of the Russian Federation, that for the flourishing of small science business "it is possible to shut one's eyes to the stealing of intellectual state property. For it remains on our territory" (IZVESTIYA, 8 January 1992).

It is possible to take an even broader view of the problem of establishing law and order in relations with intellectual property. The pretensions to establish clear-cut law and order in the production, distribution, and consumption of objects of intellectual property are in essence the demands, which have been reduced to legal formulations, of a new, still forming class of our society, the so-called middle class: the intelligentsia, entrepreneurs, farmers, skilled workers, and managers. But since the 19th century it has been well known that only that class can achieve success in the struggle for power, well-being, and prosperity, when it formulates its pretensions as clear legal demands and assembles precisely under these legal banners its supporters.

Finally, a market economy requires completely different legal forms of intellectual property, which are coincident with it. The buyer of an object of intellectual property should be sure that he is buying it from the owner, that no one will contest to whom this object belongs and, consequently, will not lay claim to the income from the use of an invention. For the holder of a patent the monopoly on the use of his invention in production is also a very effective method of obtaining deserved income. Both the client and the institute, which made available on order (under contract) the conditions for development, as well as numerous, now very specialized innovation firms, societies, companies, and so on are interested in the certainty of relations.

That is why K. Borovoy is actually correct: Without certainty and stability with intellectual property it is

impossible to establish a modern civilized market. The experience of countries with a market economy demonstrates this very well.

The expanding range of objects of intellectual property is also gradually turning the market from material to intellectual property. Computer programs, new biotechnological objects, the layouts of integrated circuits, formulas, and much more are becoming integral components of goods of the most diverse type.

With the transformation of the products of intellectual activity into commodities an opportunity appears for their creators to obtain not only a reward (a wage, bonuses), but also a portion of the revenues from the use of an invention, know-how, or another creative commodity. This right of the creator to a portion, which is specially stipulated in agreements, of the revenue, which a firm, an enterprise, or an institute derives as a whole, has begun to be called "royalties." The long-awaited determination of the real value of creative labor and the increase of the income of the intelligentsia are connected with royalties. And in general this entire process leads to the confirmation of the priority of creative labor over its other forms and determines the real place of the intellectual in social production.

However, when the legislator begins to translate into the legal language of norms and orders these, it would seem, entirely clear sociopolitical and economic demands, new problems arise.

The first one is:

#### THE DEFINITION OF INTELLECTUAL PROPERTY.

A while ago in all legal encyclopedic dictionaries it was possible to read that intellectual property is merely a conventional, collective term. But then this term appeared in legislation, for example, in the Law of the Russian Federation "On Property in the RSFSR" of 24 December 1990, in which it was a matter of an entirely unconditional understanding of intellectual property and of its objects. Thus, the entirely realistic task of the definition, moreover, namely legal and not, say, political science or sociological definition, of this intellectual property itself arose.

Such a definition, as it turned out, is present in the Convention, which establishes the World Intellectual Property Organization (WIPO) and was signed, including by our state, in Stockholm on 14 July 1967. There it is indicated that intellectual property includes rights, which apply to literary, artistic, and scientific works; the performance of actors, a sound recording, radio and television broadcasts; inventions in all areas of human activity; scientific discoveries; industrial prototypes; trademarks, service marks, firm names, and commercial symbols; protection against unfair competition.

Moreover, the Convention records "as well as all other rights, which apply to intellectual activity in the production, scientific, literary, and artistic fields."

Thus, intellectual property is the ownership of rights, which it is not that easy for social consciousness to grasp. Ancient Roman lawyers tried to differentiate corporeal and incorporeal things. "Corporeal things are those which can be touched.... Incorporeal things are those which cannot be touched; such are the things, which consist of a right, are rights," they wrote (*Digesty Yustiniana (Institutes of Justinian)*, Moscow, 1984, p 39).

But the definition of intellectual property, which is given in the Convention, divided lawyers into supporters of a narrow and a broad approach.

In the opinion of some, the list, which is given in the Convention, is exhaustive. In the opinion of others, this list is not closed either in the area of rights—in the Convention "all other rights" are mentioned—or in the area of the objects of intellectual property—"intellectual activity in the production, scientific, literary and artistic fields" is mentioned.

Alas, this is not at all a scholastic debate. At any rate, when in the summer of 1991 the draft of the legislative act "On Scientific Intellectual Property and the Increase of Its Protection," which had as a goal to establish law and order with the production and use of the results of scientific research, design, surveying, experimental design, and experimental technological work, was prepared and was considered in the USSR Supreme Soviet, one of the "trenches," which the opponents occupied, ran along the line "but this is not in the Convention"! The references of the supporters of the draft law, that not all the results of research and development are patented, that is, are inventions and not all are protected by a copyright (this right protects only the form of a work!), did not convince the opponents. The references to the last paragraph of the Convention, in which the other rights, which apply to intellectual activity in the scientific area, are spoken about, also did not convince them.

As is known, it was not possible to conclude this debate. But the problem remained. And as before various smart operators from commerce are fattening on it.

Also no less important is the second problem:

#### THE CONTENT OF THE RIGHT OF INTELLECTUAL PROPERTY.

Indeed, what is there in common between a dancing pop music composer and a pop music performer, a hacker who has gotten carried away in his night vigil, and a laboratory worker in white coveralls, who is the creator of artificial genes? And also, of course, an inventor, a journalist?...

Legal doctrine and legislation reply: Each of them has the exclusive right to the result of intellectual activity, which was created by them. He obtained or created a result and

immediately—whether you like it or not—became the bearer, the holder of the exclusive right of intellectual property.

This right is exclusive because it belongs exclusively to the author, the developer, the inventor, the maker—in short, the creator. It consists of a number of legal rights—more specific rights, kinds of legal atoms of a large molecule—the exclusive right of intellectual property: the legal rights to authorship, to the publication, reproduction, and dissemination of one's work by some means or another, under one's own name, under a pseudonym, or anonymously; to the receive of a reward; to the permitting (licensing) of other people to exercise some legal rights (for example, a publishing house to publish a work of art, an enterprise to use an invention); to the inviolability of a work, the inadmissibility of its duplication without the permission of the author; to the receipt of a share of the revenue, and so on. In different combinations these exclusive rights form either a copyright, an inventor's (patent) right, or another right of intellectual property.

But not everything in the differentiation of the content of the rights of material and intellectual property is that simple. Yes, in intellectual property it is necessary to differentiate knowledge, ideas, and information themselves and their media, that is, the objects, on which the knowledge, ideas, and information are recorded. For example, an artistic image, a drawing, and the canvas, on which it has been executed, a computer program and the diskette, on which it is recorded, an invention, that is, some new technical solution, and a drawing, and so on. It is clear that the value of the result itself of intellectual activity and the value of the medium (canvas, paper, a magnetic disk) are different.

But what is to be done, for example, when knowledge, an idea, and a formula can only exist and be objectified in unity with their medium? For example, an industrial prototype, design documentation, a physical model, a program for a computer in the form of a technical device, a strain, an artificial gene, and so forth? In this unity of theirs, with the medium, in their objectified capacity the objects of intellectual property can also act as objects of material property—it is possible to own, use, and dispose of an industrial prototype.

The possibility of supplementing exclusive rights with the legal rights of material property consists in this unity of information (knowledge, data, formulas, ideas) and the medium. These legal rights can act as subsidiary rights. And in many modern contracts and agreements, which concern intellectual property, precisely these additional rights to the objects of intellectual property are recorded (in another words, "all other rights" from the wording of the Convention are used).

But wherever information, knowledge, and ideas are recorded on different media, wherever they, as they say, are invariant to their medium (for example, the same

song is a sheet music recording, a record, a cassette), there, as a rule, only the construct of exclusive rights operates.

It is clear that this is also not a scholastic problem, inasmuch as the income and other social benefits of specific people, organizations, and so forth are connected with one set of legal rights or another.

The next problem is:

#### THE DEFINITION OF THE INTELLECTUAL OWNER OF THE SUBJECT OF THE RIGHT OF INTELLECTUAL PROPERTY.

Can the owner of a result, for example, a design development, be not its creator himself as a natural person, but the institute, design bureau, or plant, where this creator works? Particularly when such a development appeared as a result of a specific job assignment? Can a ministry, which made the corresponding order and financed the experimental design work, be such an owner? Or a concern, a consortium? Or even the state?

...Here is just one specific legal tragedy on the scene of intellectual property, which was caused both by the lack of legal regulation and by the inadequate legal level of its participants. A young talented associate of one domestic scientific research institute was sent to work at a German institute. There they accepted him on a special stipend, but at the scientific research institute he retained a portion of his wage.

At the German institute he took part in the development of an instrument, and this institute began to draw up a patent for the developers of the original instrument, having included among the developers the associate of the scientific research institute. However, the former scientific supervisor of the associated declare his disagreement with this decision and began to demand his own inclusion among the developers of the instrument, inasmuch as, he said, the associate had used the knowledge that had been acquired while working at the scientific research institute under his supervision. Of course, neither at the scientific research institute nor at the German institute had any agreements with the associate on the right of intellectual property in his development been concluded. The associate did not know about such a possibility, while the scientific research institute or the scientific supervisor had also not seen to this.

Who is right here? Of course, in this specific situation the scientific associate and the German institute. However, the domestic scientific research institute had the opportunity in a special agreement with the associate to settle otherwise the question of the right of intellectual property. Now legislation establishes that if there is the appropriate agreement between the employer and the worker, the patent for an invention, which was developed by the worker, is issued to the employer—Article 4 of Point 2 of the Law on Inventions in the USSR. But this rule is valid only for inventions which are developed as a result of the accomplishment of a specific task in

accordance with an assignment that is given to a worker. Article 146 of the Fundamentals of Civil Legislation of the USSR also speaks about this. The Patent Law of the Russian Federation (in the draft) also solves this problem.

In short, if an agreement is concluded between the employer and the worker, that is, the good will of the worker is implemented, the right of intellectual property can belong to a legal person—an institute, a consortium, a joint-stock company, and so on.

In other intellectual spheres the situation is similar. If an agreement on the cession of the rights to future results is concluded between the employer and the author, the employer becomes the intellectual owner. In short, the principle: "He who pays the piper calls the tune," triumphs.

And it is easy to understand this new trend of legislative decisions. Research and development are very expensive. Whoever finances them wants to have guarantees—the right of intellectual property should belong to him. But, on the other hand, at times precisely such a solution of the problem also becomes more advantageous for the scientist himself—it is very difficult to organize the innovation process and to break through to the market, special knowledge and venture capital are needed. Let specialized people or even organizations deal with this, but they should, as they say, "unfasten" a portion of the income for the scientist himself.

Another tricky problem of intellectual property—THE DETERMINATION OF THE VALUE—is connected with the market and "royalties." Norms, which allow there to be transferred to the authorized capital stock as the contribution of a founder various property rights (patents, licenses), as well as know-how and other objects of intellectual property, have appeared in the legislation on economic societies and companies. How is one to evaluate these intellectual contributions? How much, for example, is the knowledge about some technologies or others and methods of the production of various innovations in industry, agriculture, medicine, and transportation worth?

Existing accounting methods are not always applicable. The market also does not always give an answer. Thus, what about agreements?

Practice has headed in this direction, creating very amusing situations. Let us recall that when establishing one of the joint-stock companies, which included the Space Communications Center, Vnukovo-3, and a number of other military-industrial facilities with a formal value of hundreds of millions of rubles, 14 natural persons—prominent figures of the military-industrial complex, whose intellectual contribution was also valued at many millions of rubles—also became founders. In other words, they began to understand by intellectual property not the sum of the exclusive property rights, but the person himself with his knowledge. And these figures valued themselves very, very highly. In

short, another ingenious means of transferring the nomenclature from the sphere of state property to the sphere of private property, which promises large revenues, was found. A large share of the profit, after all, is due to the founders for their contributions. But you would also not envy the procurator—and this case was turned over to him: In the disputes about how much intellectual property is worth so far there are no fixed criteria.

#### Another problem is THE PROTECTION OF INTELLECTUAL PROPERTY.

In the sphere of the copyright a principle, which prohibits without the consent of the author the duplication of his works (what is called the "copyright" [kopirayt]), is beginning to operate. It is particularly important under the conditions, when all kinds of copying and reproducing equipment—Xerox machines, video systems, cassettes, and so forth—have appeared. Under these conditions the corresponding restrictions on copying and duplicating are appearing in the legislation. Here, of course, the methods of monitoring and, accordingly, protecting intellectual property are still very unreliable and very difficult. Such offenses should be punished severely. The formation in the country of private property is impossible without the cultivation of respect for the property of others. And the objects of intellectual property should be among it.

Some people in this connection advocate the comprehensive registration of objects of intellectual property and the establishment of registers. Yes, with respect to some objects of intellectual property (for example, the registration of patents) this is becoming a possible, although difficult thing. But with respect to other objects this matter thus far seems hopeless. Incidentally, it is possible that the established Russian Intellectual Property Agency will undertake the solution of this problem.

Another means of protecting intellectual property from unfair competition and embezzlements is the legislative or contractual guarantee of confidentiality in the area of various know-hows and other objects and the keeping of commercial and other secrets.

In a number of legislative acts of several countries it is established that even a worker, who has left a job at a firm or research center and has transferred to a job at another firm or another enterprise, does not have the right for several years at the new place of work to divulge the data that became known to him at the former job. Otherwise there are damages, a fine, and even criminal punishment.

A contractual form of the regulation of intellectual relations, including contractual liability, may work well for the protection of the right of intellectual property, as well as for the settlement of many questions in this sphere. In the agreement (contract) with workers and an organization all questions of the protection of the right of intellectual property can and should be stipulated. And here, in addition to the compensation of damage (losses,



lost profit), the property compensation of the moral harm, which is done to the creator by various offenses—from plagiarisms to the vulgar embezzlement of objects of intellectual property—should be used extensively.

#### Finally, THE PROBLEM OF THE LEGISLATIVE GUARANTEE OF INTELLECTUAL PROPERTY.

It is formulated by some scientists and experienced workers in the following way: A law on intellectual property and its protection is needed.

I have tried to show that in our country there is specific legislation which regulates relations in several spheres of intellectual property. Norms on the copyright and inventor's right were always present in the Civil Code of the Russian Federation. Although inadequate, they were present. Now this legislation has been supplemented by the Law "On Inventions in the USSR," the laws on industrial prototypes, trademarks, and service marks, and the Fundamentals of Legislation of the USSR. These legislative acts, inasmuch as they are not at variance with the RSFSR Constitution and other of its laws, for the present are still in effect on the territory of the Russian Federation.

Special laws have also been passed in the the Russian Federation itself—the Patent Law and several others.

But, of course, both the old legislative acts and the new laws should solve the real problems, which were discussed above, and not only them.

The thorough updating of the Civil Code of the republic, particularly in the area of the copyright and the rights accompanying it, is needed. Perhaps, a special law on the copyright should be passed—as was done in other countries, for example, in Spain. Legislative acts on computer programs and on databases—inasmuch as not all questions of their production and use can be settled within the framework of the copyright.

As before legislative acts on scientific intellectual property are needed.

In short, we should take the path of the gradual accumulation of legislative acts that regulate various spheres of intellectual property. While the future will show whether it will be possible to produce a single comprehensive legislative act on intellectual property and whether there will be a social need for it. However, the fact that it is necessary already now, without delaying, to regulate the relations in the sphere of intellectual property and its protection, is an axiom.

[Editorial note] The article will be published in a more complete version in No 4 of the journal OBSHCHESTVENNYE NAUKI I SOVREMENNOST.

**Statute on Sino-Russian Economic-Trade, S&T Commission***927A0276A Moscow ROSSIYSKIYE VESTI in Russian 29 Aug 92 p 3*

[Decree No. 551 of the Government of the Russian Federation of 5 August 1992, "On the Draft of the Statute on the Russian-Chinese Intergovernmental Commission for Trade, Economic, and Scientific and Technical Cooperation," and text of the draft of "The Statute on the Russian-Chinese Intergovernmental Commission for Trade, Economic, and Scientific and Technical Cooperation"]

[Text] **The Government of the Russian Federation**

**Decree No. 551 of 5 August 1992. Moscow**

**On the Draft of the Statute on the Russian-Chinese Intergovernmental Commission for Trade, Economic, and Scientific and Technical Cooperation**

To approve the draft of the Statute on the Russian-Chinese Intergovernmental Commission for Trade, Economic, and Scientific and Technical Cooperation (attached), which was prepared by the Ministry of Foreign Economic Relations of the Russian Federation.

To charge the Russian section of the indicated commission to submit this draft for the approval of the first meeting of the Russian-Chinese Intergovernmental Commission for Trade, Economic, and Scientific and Technical Cooperation, having permitted in this case the Russian Party during the discussion to make in the mentioned draft of the Statute on the Commission individual refinements and additions, which are not of a fundamental nature.

[Signed] Ye. Gaydar

**Draft**

**The Statute on the Russian-Chinese Intergovernmental Commission for Trade, Economic, and Scientific and Technical Cooperation**

This Statute was drafted for the purposes of supporting the work of the Russian-Chinese Intergovernmental Commission for Trade, Economic, and Scientific and Technical Cooperation.

**1. The Basic Directions of Work**

The Russian-Chinese Intergovernmental Commission for Trade, Economic, and Scientific and Technical Cooperation, which hereinafter is called the Commission, is an intergovernmental body, which is being formed in conformity with the understanding between the Russian Federation and the People's Republic of China, which was formalized by exchanged letters of the Parties of 29 December 1991 and by the Statute on the Russian Sections of Intergovernmental Commissions for Trade, Economic, and Scientific and Technical Cooperation With Foreign Countries.

The Commission coordinates the cooperation between the two countries, promotes its development in such areas as economics, trade, science and technology, transportation, education, and other areas, identifies as much as possible the potentials of cooperation, increases its effectiveness, solves the problems that arise in the course of cooperation, and determines its new directions.

**2. The Structure**

The Commission consists of the Russian and Chinese sections.

The governments of both countries in consultation with the appropriate ministries and departments approve the Chairman, the Deputy Chairman, the responsible secretary, and the members of their sections of the Commission. The Chairmen of the sections notify each other of the personnel of the sections of the Commission and its changes.

**3. The Organization of Work**

The Commission holds its meetings once a year alternately in the capitals of both countries. The Chairman of that section of the Commission, in the country of which the meeting is being held, chairs the meeting.

The parties one to two months before the meeting come to an agreement on the date of its convening and exchange in advance drafts of the agenda of the meeting and two weeks before the start of the meeting get final agreement on it and exchange drafts of the records of the meeting. Seven to 10 days before the start of the meeting groups of experts, which are headed by the responsible secretaries of the national sections, perform work on preparing for the meeting and in principle get agreement on the record of the meeting.

The records of the meetings of the Commission are drawn up in Russian and Chinese, moreover, both texts are equally valid.

At the meetings of the Commission questions, which the Chairmen of both sections will come to an agreement to discuss, are examined.

The decisions, which are made by the Commission at the meetings with the mutual agreement of both sections, are entered in the record and take effect after its signing by the Chairmen of both sections.

The decisions entered in the record, which, in the opinion of one of the sections of the Commission, are to be approved by the corresponding bodies of its country, take effect after the notification of the Chairman of the corresponding section of the Commission of their approval.

During the period between meetings of the Commission the Chairmen of both sections can convene extraordinary meetings of the Commission or make joint coordinated decisions on individual questions without the

holding of meetings. In the latter case these decisions are entered in the record at the next meeting of the Commission.

In accordance with the results of the held meetings the Chairmen of the sections of the Commission submit to their Governments a report with the corresponding proposals.

#### **4. The Bodies of the Commission**

The Commission can set up subcommissions and working groups.

The above-indicated bodies are set up by agreement between the national sections of the Commission and perform work in accordance with the statute and decisions of the Commission, which have been approved by the Commission.

The national sections of the subcommissions and working groups regularly notify of their activity the Chairmen of the national sections of the Commission. Two weeks before the convening of the regular meeting of the Commission the national sections of the subcommissions and working groups report in writing to the Chairmen of the national sections about the work, which was done since the preceding meeting of the Commission, as well as submit proposals for inclusion in the draft of the agenda of the next meeting of the Commission.

#### **5. The Duties of the Responsible Secretaries**

The responsible secretaries are accountable for the daily work of the national sections of the Commission, coordinate the activity of its subcommissions and working groups, prepare documents for the meetings of the Commission, as well as fulfill other duties that are connected with the activity of the Commission.

For these purposes the responsible secretaries maintain constant contact with each other and if necessary meet during the period between meetings of the Commission.

#### **6. The Expenses Connected With the Holding of Meetings**

The section of the Commission, in the country of which the meeting is held, bears the expenses that are connected with the holding of the meetings of the Commission, including the living and eating expenses of their participants.

The number of participants in the meetings, whose eating and living expenses the Parties reciprocally take upon themselves, should be determined on a parity basis.

The sending Party bears the travel expenses of the meeting participants from their country to the country, where the meeting is being held, and back.

#### **7. Amendments of This Statute**

By agreement of both sections the Commission has the right to make amendments and additions to this Statute.

**'Hostile Attitude' Toward Science in Azerbaijan Criticized**

927A0277A Baku BAKINSKIY RABOCHIY in Russian  
28 Jul 92 p 2

[Article by Doctor of Agricultural Sciences Prof. I. Sadykov: "Why the Scientific Potential Is Disappearing"—first paragraph is BAKINSKIY RABOCHIY introduction]

[Text] As is known, three factors—science, labor, and democracy—move civilization. The great physiologist K. Timiryazev also indicated the exceptional importance of these components of socioeconomic processes: "Only science and democracy, knowledge and labor, having entered into a free, close union that is based on mutual understanding, will overcome everything, will recreate everything for the good of all mankind."

In our republic, which is acquiring independence under the conditions of emerging democracy, unfortunately, proper attention is not being devoted to science, its development, the training of scientific personnel, and their retention. All kinds of speculations around science are very dangerous. Individual leaders, who are invested with power, but are ignorant in science, in defiance of common sense and for the benefit of the situation repeatedly struck and to this day are striking blows to science and are forming among the poorly trained part of society a negative and even hostile attitude toward it.

The distressing position of scientists of sectorial scientific research institutes of the republic of all directions intensified the drain of doctors of sciences to teaching work at higher educational institutions and of highly skilled specialists to various kinds of cooperatives, as well as to scientific institutions of the Academy of Sciences of Azerbaijan, where one-sided privileges for academic organizations are in effect. By way of proof I will cite an example. Thus, the work leaves for candidates and doctors of sciences at departmental institutes come to 24 workdays, while at academic institutes doctors of sciences receive 48 workdays and candidates of sciences receive 36. As to working conditions and the supply of departmental institutes with scientific and technical equipment as compared with academic institutes, here one does not have to say anything—the difference is rather appreciable.

With the disintegration of the Union and the formation of independent states isolation appeared between scientists and scientific institutions, which had a very adverse effect on scientific research work. Some difficulties with financing and the development of the ties, which once existed with scientists and scientific institutions outside Azerbaijan, appeared. Meanwhile, science is international in its essence, it does not have state, national, and regional boundaries. Life, history, and experience have shown that the splitting up and confinement of science in a national and state framework lead to degradation. Science is not just a productive force, it is the basis of the spiritual consolidation and integration of society.

The ultrapatriotic sentiments of some leaders with respect to agricultural science in Azerbaijan, which found expression in arrogance and reliance only on one's own forces while ignoring the achievements of science in neighboring republics, do a disservice. As a result the scientific research institutes of the Ministry of Agriculture and Food of Azerbaijan found itself under the most serious conditions of an acute shortage of highly skilled scientific personnel. In such specialties as plant growing, farming, selection and seed growing, fodder production, and grassland management either there are no doctors of sciences or at best there are a handful. In the immediate future the reinforcement of their ranks is not foreseen. But if we make a comparison, in Russia in agriculture the scientific potential consists of 184 scientific institutions, including 96 scientific research institutes. In Azerbaijan there are about 20 institutes of this type with tens of experimental stations and experimental farms. This is significantly more, taking into account the territory, the level of agriculture, and the population. But with respect to the efficiency of scientific developments and their introduction in production and the productivity of plant growing and animal husbandry Azerbaijan cannot boast of anything.

Both objective and subjective factors, which adversely affected the development of agricultural science and the training of personnel, and a biased attitude toward and a disregard of the role and work of individual prominent scientists of the republic due to personal, tendentious, and regional interests and the absence in collectives of a healthy microclimate took place here. All this had the result that the drain of doctors and candidates of sciences from scientific research institutes occurred.

Our scientists are the most ill-provided and unprotected stratum of society. Under the conditions of inflation and socioeconomic differentiation they are becoming increasingly poorer and poorer. The prestige of scientists is declining catastrophically. Effective steps on the attraction to science of talented young people, who have displayed the ability and aptitude for exploratory work, are necessary in order to halt this regression.

I undertake to assert that the neighboring Transcaucasian republics in the matter of the training of scientific personnel and specialists in the field of agriculture are in a better position. At present in our republic the defense of doctoral dissertations in the specialty "agricultural sciences" does not take place. Specialized councils for the defense of dissertations for the academic degree of doctors of sciences are lacking. In Georgia there are two institutes that have the right to accept for defense doctoral dissertations in three agricultural specialties, in Armenia there are also two institutes in four specialties. In the area of economics the situation is exactly the same. However surprising, Azerbaijan, where 128,000 hectares are taken up by fruit crops and 162,000 hectares are taken up by vineyards, does not have a specialized council for the defense of doctoral and candidate dissertations in these spheres. While Armenia, accordingly, having 36,000 and 10,000 hectares taken up by fruit

crops and vineyards, has a scientific research institute of viticulture, viniculture, and fruit growing with a specialized council for the defense of dissertations.

However paradoxical, it would seem, three years ago on the order of republic Minister of Agriculture and Food M. Abdullayev (he is a specialist in viticulture and viniculture) the Azerbaijan Scientific Research Institute of Viticulture was eliminated. But, thank God, sensible executives were found. Owing to the intervention of superior organs it was possible to reverse the blasphemous verdict.

In short, the situation with the training of scientific personnel in the area of agriculture is causing extreme anxiety. We, in particular, wrote in the press about these problems. Moreover, we repeatedly appealed personally to the President of the republic, to the Cabinet of Ministers of Azerbaijan, and to the Ministry of Agriculture and Food. But we came up against a blind wall of indifference. Given such an attitude it is possible to lose the entire scientific potential. Today, it appears, no state body is dealing with this problem. But time is marching on, and it is working against us.

In connection with the fact that only one higher educational institution for the training of specialists for the countryside is now functioning in the republic, we raised this question on the pages of the newspaper BAKIN-SKIY RABOCHIY, addressed to the Cabinet of Ministers the proposal to expand the network for the training of specialists of the highest skill, and noted the necessity of establishing at first affiliates of the Azerbaijan Agricultural Academy in Baku and Sheki and of transforming the Salyany Tekhnikum into an agricultural institute.

But here, too, we were not heard. The explanation of some scientists and executives that we have many specialists of the highest skill in agriculture is groundless and unfounded.

For it is coming down to the development in the republic of farms and a private sector alongside the public sector. But this circumstance worries absolutely no one. Let the people, to whom the interests of our people are dear, consider properly that Azerbaijan cannot become independent and free without highly educated specialists and a solid agricultural material base. In this matter one must not, despite the tragedy of Karabakh, waste time.

And another thing. Our republic in the area of plant growing does not have its own gene bank, where it is possible to store a collection of specimens of cultivated and wild forms, which have been collected directly at the sites of their natural habitation, as well as local populations and biotypes of strains of cereal, leguminous, fodder, technical, vegetable, cucurbitaceous, ornamental, and aromatic medicinal crops. In the past we obtained such materials as stock materials for selection from the All-Union Institute of Plant Growing (Leningrad). Now this route is nearly cut off for Azerbaijan. Therefore, without putting the matter off, it is necessary to begin the construction of a seed depository. It is good

that luckily for our people we have a prominent scientist-organizer, breeder, and geneticist, Academician Imam Mustafayev, a patriot, tireless worker, enthusiast, and well-known person not only in the republics of the former Union, but also in many countries of the world, to whose services I recommend that we turn.

We also repeatedly drew special attention to the fact that in the Ministry of Agriculture and Food with its large network of scientific institutions in essence there is not one powerful, highly skilled scientific center for the organization and management of science and the scientific potential. The mediocre administration of science, which is now absolutely without rights, with its meager staff of specialists of low skills seems unsightly and very antiquated. It is necessary to change the situation radically. Otherwise we not only will lose everything that we have today, but also will be deprived of any future.

#### **President Karimov Decree in Support of Uzbek Science**

927A0277B Tashkent PRAVDA VOSTOKA in Russian  
23 Jul 92 p 1

[Decree of the Cabinet of Ministers attached to the President of the Republic of Uzbekistan "On Measures on the State Support of the Development of Science and Innovation Activity"]

[Text] To execute the Ukase of the President of the Republic of Uzbekistan of 8 July 1992, "On the State Support of Science and the Development of Innovation Activity," and attaching great importance to the strengthening of the scientific and technical potential, to the reorientation of scientific research toward the solution of important problems of socioeconomic development, and to the intensification of innovation activity, as well as for the purposes of the accomplishment of the tasks that were specified during the meeting of the President of the Republic of Uzbekistan with scientists of the Academy of Sciences, the Cabinet of Ministers resolves:

1. The State Committee of the Republic of Uzbekistan for Science and Technology jointly with the Ministry of Finance and the Main State Tax Administration are to specify and approve by 1 September of this year and subsequently annually until 1995 the types of innovation and economic contractual scientific research work, which is to be exempt from the value-added tax.
2. The State Committee of the Republic of Uzbekistan for Science and Technology jointly with the Academy of Sciences, sectorial academies, the Ministry of Higher and Secondary Specialized Education, and the Committee for the Forecasting of the Prospects of the Development of Uzbekistan are to draw up and submit within a two-month period for government approval a list of the priority directions of the development of science, technology, and state scientific and technical programs, with the specification of the head organizations that are responsible for their implementation.

3. The State Committee of the Republic of Uzbekistan for Science and Technology, the Academy of Sciences, and the Ministry of Higher and Secondary Specialized Education:

are to formulate a long-range program of the training of candidates and doctors in the priority directions of science and technology;

are to ensure the annual sending for a training period at foreign centers of not less than 20 talented scientists from among young people.

4. The Committee for the Forecasting of the Prospects of the Development of Uzbekistan and the Ministry of Finance are to envisage the allocation of the necessary currency assets and their ruble backing for the training period of scientists at foreign centers.

5. The State Committee for Science and Technology jointly with sectorial ministries and concerns within a three-month period is to make an analysis of completed scientific developments and to submit proposals on their implementation.

6. The Academy of Sciences jointly with the State Committee for Science and Technology, sectorial academies, and the Ministry of Higher and Secondary Specialized Education within a two-month period is to organize on the basis of subdivisions of the Academy of Sciences a republic innovation and commercial exhibition center for the purpose of their advertisement and sale on the domestic and foreign market.

7. The State Committee for Science and Technology and the Ministry of Foreign Economic Relations jointly with the Academy of Sciences, sectorial academies, and the Ministry of Higher and Secondary Specialized Education within a three-month period are to ensure the formulation of a program of international scientific and technical cooperation, having envisaged:

steps on the legal protection of scientific and technical research and development, the increase of their competitive ability, the increase of the volumes of the sale of licenses and patents, and the extensive advertisement of the achievements of scientists of Uzbekistan abroad;

the establishment of joint ventures, venture companies, innovation programs and projects based on advanced technologies and scientific developments of scientists of Uzbekistan.

8. The Academy of Sciences of the Republic of Uzbekistan:

is to develop the work in the area of the genetic engineering biotechnology of cotton and other crops (the Geninmar Program). For this within a month to establish the Institute of Genetics, having united the Institute of Phytopathology and its subdivisions, including the Syrdarya Base (the existing scientific production and social base), with the laboratory of genetic engineering biotechnology of the Institute of Bioorganic Chemistry imeni Academician A.S. Sadykov;

is to increase the production of pheromones and drugs based on gossypol at the pilot experimental base of the Institute of Bioorganic Chemistry;

is to expand the range and the production volume of drugs, to develop and assimilate in 1992 a waste-free technology of the processing of sugar beets and a technology of the production of a sugar substitute from the above-ground part of stems at the pilot experimental base of the Institute of Chemistry of Plant Substances.

9. To allocate to the Academy of Sciences in 1992 from the currency fund of the Cabinet of Ministers by specific designation for the work indicated in point 9 assets in the amount of \$1.75 million, of which to allocate \$1.2 million to the Institute of Chemistry of Plant Substances, \$250,000 to the Institute of Genetics, as well as \$300,000 for the acquisition of foreign literature and participation in international scientific unions.

10. The Ministry of Finance is to allocate to the Academy of Sciences in 1992 from the reserve fund of the Cabinet of Ministers for the expansion of the production volumes of drugs, the development and assimilation of technologies, as well as for the ruble backing of the currency being allocated assets in the amount of 17.63 million rubles [R], including by specific designation R14.39 million to the Institute of Chemistry of Plant Substances, R2.3 million to the Institute of Bioorganic Chemistry, and R430,000 to the Institute of Genetics.

11. The Ministry of Foreign Economic Relations is to study the possibility of the sale of drugs and science-intensive products of scientific research institutions of the republic in foreign countries, as well as the possibility of the establishment of joint ventures for their production.

12. To assign the monitoring of the fulfillment of this decree to Deputy Prime Minister M.K. Karabayev.

[Signed] Chairman of the Cabinet of Ministers I. Karimov

**'POISK' Science News Briefs 8-14 August 1992**

927A0284B Moscow POISK in Russian No 32 (171),  
8-14 Aug 92 p 2

[Article]

[Text] Figure

It is necessary to increase by nearly sixfold as compared with 1991 the financing of the All-Russian Institute of Scientific and Technical Information just to continue work at the level of last year.

- **The government of the Russian Federation adopted a decree on the formation of the Federal Ecology Fund of the Russian Federation.** The financing of and extension of credit for federal ecology programs and scientific and technical projects will be among its tasks.

The fund will be formed by means of fines for the pollution of the natural environment and other receipts.

- **The president of the Russian Federation promulgated the ukase "On the Scientific and Information Support of the Problems of Disability and the Disabled."**

In conformity with it the conducting of scientific research in the priority directions of state policy with respect to the disabled should be organized at scientific research institutes and higher educational institutions of Russia. The task "to settle the question of the establishment of doctoral studies and a specialized academic council for the defense of candidate and doctoral dissertations and the introduction of a scientific specialty in the problems of disability and the disabled" was also posed.

The Russian Academy of Sciences will take part in the establishment of an interdepartmental council for the indicated problem. It is also planned to organize the Russian Scientific Research Institute of Problems of Disability and the corresponding national information and research center.

- **In the last issue POISK reported the organization of the Council of the RAS [Russian Academy of Sciences] for Cooperation With the Government of Moscow and the Oblast.**

A number of proposals on the improvement of the ecological situation in Moscow and the oblast have already been submitted to the council. Their authors are scientists of the Institute of Synthetic Polymer Materials of the RAS. The ISPM [Institute of Synthetic Polymer Materials] can help to change the wood working industry over to the production of ecologically clean products and to increase the fire safety of wooden structures and the survivability of metal structures when they are exposed to high temperatures. The institute is also prepared to make available technologies of the recovery and processing of industrial scraps of polymers, rubbers, and items made of them.

- **The International Federation of Nonlinear Analysts has opened its representation in Moscow—the Russian Division of the IFNA [International Federation of Nonlinear Analysts].** Academician of the RAS V. Matrosov was appointed chairman.

The federation unites scientists of various specialties, who are engaged in the comprehensive study of the nonlinear phenomenon of nature on the basis of mathematical modeling.

In a few days the World Congress of Nonlinear Analysts will open in the United States. An anniversary session, which is devoted to the 100th anniversary of the publication of the basic work of the great Russian mathematician Aleksandr Lyapunov, will be held at it. Academicians of the RAS K. Frolov, V. Matrosov, O. Ladyzhenskaya, and A. Samarskiy were included on the Global Science Committee of the congress.

The contact telephone number of the Russian Division of the IFNA is: 238-49-28. The address is: 111049, Moscow, Box 11.

- **The second international conference on computer graphics, Grafika-92, will be held in Moscow from 28 September to 2 October.** Its organizers are the Moscow Grafo Society, the Institute of Applied Mathematics of the RAS, the Institute of High-Energy Physics, the Union of Architects, and the American computer graphics society SIGGRAPH of the Association for Computing Machinery. Within the conference the "Information Technologies in Education" Association (INTO) with the participation of the IBM Corporation is organizing a scientific methods seminar devoted to the problems of the use of computer graphics in preschool education and the elementary, secondary, and higher schools.

Those wishing to participate in the work of the conference should send applications by 25 August 1992 to the address: 107078, Moscow, Ulitsa Sadovaya Chernogryazskaya, Building 4, the Kudits Joint-Stock Company with the note "Grafikon-92." The contact telephone numbers are: 208-78-62; 207-43-14; 320-31-10.

**'POISK' Science News Briefs 1-7 August 1992**

927A0284A Moscow POISK in Russian No 32 (170),  
1-7 Aug 92 p 2

[Article]

[Text] Figure

\$23,700—such is the cost of the education of one undergraduate at Harvard University during the 1991-1992 academic year excluding the cost of medical insurance.

Quotation

"Real science is the aristocratic pursuit of those people who devote themselves to this. The longstanding desire

to know, which solely would avert the crisis of science, is a quality of the individual and is realized by him at his own risk."

Karl Jaspers, German philosopher and psychiatrist

#### Fact

The Council of Europe has begun the discussion of the question of including Russia in its educational programs and of granting it in connection with this 300 million European currency units.

- **The four laws on intellectual property, which were passed by the Supreme Soviet of the Russian Federation, were returned to the Supreme Soviet by the president of Russia. B. Yeltsin exercised his right of veto for a formal, as they believe in the Supreme Soviet, reason. The laws were not submitted for approval to the republics of the Russian Federation, as the Federation Treaty requires. In September, they gave assurances in the parliamentary subcommittee for science and new technologies, all the formalities will be "settled."**
- **Minister of Science, the Higher School, and Technical Policy of Russia B. Saltykov, vice premier of the government of the Russian Federation, and French Minister for Research and Technology H. Curien on behalf of their governments signed the Agreement on Scientific and Technological Cooperation.**

The ministers came to the understanding that direct ties, which can and should lead to the formulation of joint working programs and to the conclusion of specialized agreements, will be developed between research institutes, organizations, and universities. Russia and France will exchange scientific and technical information, scientists, and specialists, will give each other assistance in the development of technopolises, and will establish mixed venture structures.

The parties will specify later the specific areas of cooperation.

- **The A. Venediktov and P. Stuchka Gold Medals, which were established in the late 1980's by the presidium of the USSR Academy of Sciences, have been eliminated. The Presidium of the RAS [Russian Academy of Sciences] made this decision on the basis of the decree of the bureau of the Philosophy, Sociology, and Law Department.**

The A. Venediktov Medal should have been awarded for outstanding works in the field of law, while the P. Stuchka Medal should have been awarded for outstanding works in the field of Soviet law. The medals were eliminated due to the fact that "sociopolitical and economic conditions in the country have changed." In the words of B. Toporin, director of the Institute of State and Law, this is connected first of all with the names of the people, in whose honor the medals were named: They were prominent figures, but belonged to a specific system, including a system of legal relations. Anatoliy

Venediktov was a Soviet lawyer and worked on problems of state property. Petr Stuchka was a Soviet Latvian party statesman and a lawyer.

None of the scientists ever had time to receive these medals.

- **A council for cooperation with the government of Moscow and the oblast will be organized under the presidium of the RAS.**

The council will engage in the elaboration of recommendations for Moscow authorities on the use of new developments of academic institutes. Recommendations will be issued on the use of waste-free technologies, the control of air pollution, and so on.

Scientists expect material support of this project from the authorities of the capital.

- **The branch of the All-Union Scientific Research Institute of Electrical Machine Building of the Ministry of Industry of the Russian Federation has been transferred to the RAS. Now this will be the Institute of Problems of Electrophysics within the Physical and Technical Problems of Power Engineering Department.**

It will engage in basic research in the area of electrophysics, renewable ecologically clean power, and electrophysical methods of decontamination. The IPEF [Institute of Problems of Electrophysics] will work on the development of new types of power supply sources and ozonizers. Corresponding Member of the RAS Filipp Rutberg was appointed acting director.

- **In Aksakovo near Moscow the international camp "For Peace, Nature, and Development" has concluded its work. It was organized within the framework of parallel measures of the UN conference on the environment and development. Representatives of non-governmental organizations and the clergy, scientists, and public figures from 20 countries worked on three themes: ecology, peace making, and ecological enterprise.**

The camp participants prepared a final document, in which it is proposed: to establish a coordinating council for the preparation of a world center of the handling of questions of ecology and development, to demand of state bodies the improvement of the state structure of ecology education, to seek of parliaments and governments the introduction of lenient and preferential taxation in the sphere of ecological enterprise, and so on.

- **The Supreme Soviet of Russia adopted a decree on the procedure of putting into effect the Russian law "On Education." The dates of the putting into effect of individual articles and points of articles of the law were specified. It is specified by the decree that during 1992-1994 the certification of educational institutions will be carried out by state bodies of the administration of education in accordance with a simplified procedure.**



By 31 December 1992 the Committee for Science and Public Education and the Committee for Legislation of the Supreme Soviet of Russia should submit for consideration by the Supreme Soviet proposals on bringing the laws of the Russian Federation in line with the passed law "On Education" and should ensure the revision of standard acts that are at variance with this law.

By 31 December 1992 the draft of the Federal Program of the Development of Education should also be submitted for consideration by the Supreme Soviet of Russia.

- **The presentation of the book *Vuz i rynek (The Higher Educational Institution and the Market)***, which was published by the Committee for the Higher School of the Ministry of Science, the Higher School, and Technical Policy jointly with the Chuvash State University, the Moskovskaya kommercheskaya akademiya Joint-Stock Company, and other structures (see POISK, No 31, 1992), was held at the Moscow House of Scientists.

**President B. Yeltsin addressed a letter of thanks to the authors and publishers of the book *Vuz i rynek*.**

**Raisa Chirva—From Kiev:**

#### **A Sarcophagus for the Sarcophagus?**

The government of Ukraine is promising \$20,000 to whoever proposes the optimum solution on the transformation of the regrettably well-known object "The Cover" of the Chernobyl Nuclear Power Plant.

The sarcophagus, which, as was planned, will stand for about 30 years, is rapidly becoming unfit, while, according to the estimates of scientists, 20 million curies of radioactivity remain within it. Inasmuch as the steps proposed thus far have been ineffective, the government of Ukraine has announced an international competition of designs and technical solutions.

#### **Catch Up and Surpass!**

Petr Talanchuk, the new minister of education of Ukraine, made an outing among the people. In the assembly hall of Kiev Polytechnical institute we met with executives of higher educational institutions, tekhnikums, schools, and vocational and technical schools.

They spoke, as usual, about what is most urgent. For example, there are now only five computer "seats" per 100 students. Given the present stipend it is possible to eat every other day, and then modestly. Two-thirds of the dormitories for students were built back before the war. But these "insignificant difficulties," apparently, did not scare the conference participants. They set themselves a strategic goal: in 10-15 years to bring the level of training of specialists up to the world level.

#### **There Will Be a Little Too Many**

The results of the competition of scientific research works, which was announced by the Ukrainian State Committee for Questions of Science and Technologies, have been tallied. The government decided to support the competition materially—it allocated 450 million rubles for the implementation of projects. But will this be enough? After all, one project in four got through the competition. Neither more nor less than 1,000 works were selected.

**Stanislav Fioletov—From Tashkent:**

#### **Where the Feet of the President Trod**

The government of Uzbekistan has allocated \$1.7 million to three institutes of the Academy of Sciences: the Institute of Genetics, the Institute of Chemistry of Plant Substances, and the Institute of Bioorganic Chemistry. Of this amount \$300,000 will be used for the purchase of foreign scientific and technical literature, the rest will be used for the acquisition of the necessary scientific equipment and materials, which academic scientific research institutes urgently need.

A typical feature: Republic President Islam Karimov recently visited all three institutes. Scientists joke: If the president would visit the others if only once each, perhaps, all the problems of Uzbekistan science would be solved.

#### **Negotiations, Decisions Over ITER Agreement Summarized**

927A0272A Moscow RADIKAL in Russian No 29 (86), Aug 92 pp 9, 11

[Interview with Doctor of Physical Mathematical Sciences Valeriy Alekseyevich Chuyanov, by RADIKAL commentator Marina Lapina, under the rubric "International Cooperation"; date and place not given: "The Problem of Thermonuclear Fusion Has Been Solved. For the Time Being on the Organizational Level"—first two paragraphs are RADIKAL introduction]

[Text] A quadrilateral agreement on the development of the first experimental thermonuclear reactor, the ITER [International Tokamak Reactor], has been signed in Moscow. This event went almost unnoticed, but meanwhile it merits attention if only for two reasons. First, it is a matter of a fundamentally new type of equipment, for the creation and development of which an unprecedented cooperative of scientists of the United States, Japan, Europe, and Russia (at the early stages of the formulation of the project the USSR) was established. The agreement envisages absolutely equal sharing of all the parties. Second, the unique project ran counter to the opinion of numerous skeptics, who consider thermonuclear fusion in the practical respect an unpromising direction.

Thus, on what bases, as well as for what is the intellectual collective being formed? Our commentator Marina Lapina talks about this with Doctor of Physical Mathematical Sciences Valeriy Chuyanov, one of the project directors from the Russian side.

[Lapina] Valeriy Alekseyevich, at what stage is the work on ITER now? What difficulties arose during the talks of the four parties and what compromises were found?

[Chuyanov] In 1990 the conceptual design phase was completed and talks on the start of the next, engineering phase with complete technical validation, including the development and testing of prototypes of all the systems, began. The talks were lengthy and involved. In the world there were not yet precedents for four countries on equal bases with an equal contribution and, accordingly, rights to the use of the end results to develop a completely new field of technology. A large number of technical, legal, and diplomatic questions arose. The last meeting in Tokyo concluded at 0300. At it Japanese and American lawyers discussed intensely questions of intellectual property. The very topic of the discussion helped: This is no longer basic, but not yet applied research. As a result mutually acceptable solutions were found.

The organizational problem proved to be very complicated. It was not at once possible to answer, it seemed, a seemingly simple question: Where is one to work? This is not a question of national egoism. At first I, like many of my colleagues, thought: It is necessary to bring everyone together in one place, to provide money, time, and equipment, and the project will be completed. Now the people who thought that way are admitting that they made a mistake. The project is a long-term one, people would be separated for a long time from home and from their institutes, and in these countries they would lose all professional interest in the problem.

The Europeans were the first to understand that this is a dead end and proposed a completely ridiculous, at first glance, scheme, which all the scientists at first opposed: to carry out the design of the thermonuclear reactor simultaneously at four international centers. Unfortunately, at that time we simply had cold feet and were not about to establish the fourth center in our country. For example, 50 people from the other countries would come to our country, and we would need to provide them with the conditions, to which they are accustomed, the appropriate technical supply, and, finally, communications. The latter items are particularly important. Scientists can endure everything else, but not the lack of communications and equipment. We understood that we would not be able to provide these conditions. Moreover, it was obvious that people would simply not come to our country. We were not about to insist. Understanding the situation and taking into account our services in the elaboration of the problem, the international community agreed that the coordinating headquarters of the project would be located in Moscow.

The new scheme already required the breakdown of the task, while for the exchange of information it will be necessary to enlist all communications possibilities. The San Diego-Tokyo and San Diego-Munich very high-speed communication lines are operating already now, we are now discussing a version of the hookup of a Moscow-Munich line. Over such lines we can transmit a complete drawing in half an hour.

[Lapina] But how is it possible to break down such a difficult complex task?

[Chuyanov] It is terribly difficult, but possible. A purely physical boundary of the unit exists—the vacuum chamber. Everything inside will be designed in one place; everything outside will be design in another place, while in a third place these tasks will be coordinated.

Simple logic operates here. So that all the centers would be independent, the boundary, along which the breakdown of the task passes, should be very simple and easy to describe—the natural boundary. A group in Munich will work on the first task, a group in Japan will work on the second, a group in America will work on the third.

Accordingly we set up the following administrative structure: The general director will supervise the implementation of the project. We consider that we have the best of all possible directors, the former supervisor of JET, in many respects owing to whom thermonuclear fusion was accomplished there this year for the first time in the world. He also has experience in the development of enormous machines costing billions. I am talking about Frenchman Paul Henri Rebut. I am the director of the center in America, American Parker is the director of the center in Germany, Frenchman Hugot is the director of the center in Japan, while Japanese Shumamura will be the first deputy general director for all matters. All the technical problems and personalities were agreed on last year. The very procedure of getting agreement was rather curious. The heads of the delegations were locked in a hall and did not leave there until they reached a compromise. This was a very difficult decision both with regard to personalities and with regard to the breakdown of the task among the sites, since each party was jealous about what the international center, which was located on its territory, would do, hoping to obtain some additional advantages owing to the greater proximity of their industry and engineers to the given center.

[Lapina] But what did we get in such a case, if we do not have a center?

[Chuyanov] Yes, we will not have a site, we also did not offer it. However, the presence of a site is not decisive either in the breakdown of jobs among the countries or in access to information. National teams will perform the main research at scientific institutions. The international centers ensure only integration and the coordination of the project. We received the opportunity to participate with full rights in all these jobs and access to

all the information which is produced at both the international and the national centers. Incidentally, the information center of the entire project will be in Moscow.

[Lapina] In such a case a question arises: Why did three parties fight for the organization in their countries of international centers?

[Chuyanov] Of course, each country had its own reasons for this and did not discuss them with the other participants. However, several of the reasons are obvious. The first and primary one is the maintenance of the political "visibility," noticeability of the project in one's own country, the second one is the substantial saving of assets: The work of an American physicist in America costs one-fourth as much as his sending to Japan, the third reason is the reluctance of a number of leading scientists to go abroad, and so on.

We should have signed the agreement on the project back in August of last year.... You remember that on the second day of the putsch the entire world declared a scientific boycott of our country. This should have been expected. Thank God, everything concluded very quickly. But three months were needed in order to restore the understandings. The agreement between the Soviet Union, the European Community, the United States, and Japan was initialed during the first days of November. But soon the USSR ceased to exist. Time was required until Russia was recognized as the heir.

In fact, only on 1 February did all the partners recognize Russia as the heir to the agreement, after which the parties should have given within a month the final signing date. And here a problem, which thus far I have not been able to figure out completely, arose. In Japan, apparently, departmental disagreements arose over who owns the rights to the obtained developments. The internal struggle in Japan continued a very long time.

In the end we were forced to agree to resolute steps and to warn the Japanese that joint activity would be halted, if they did not state their position. At the end of June they, at last, expressed willingness to sign the agreement, which was done recently in Washington. After the signing the parties exchanged suggestions on candidates for the council of ITER. From Russia these are Ye. Velikhov and I. Cheverev—deputy chief of a main administration of the Ministry of Atomic Power and Industry of Russia.

The first meeting of the members of the council is being held in September in Vienna, the rest will take place in Moscow (in Vienna, inasmuch as everything is taking place under the aegis of the IAEA). The council will elect a chairman and his deputies. In fact the names have already been agreed on. Velikhov will be the chairman, while Japanese Yioshikawa will be his deputy. Then they will appoint the director, although the names, as I have already said, have also been agreed on.

[Lapina] What is the difference in the functions of the board of directors and the council?

[Chuyanov] These are essentially organs of executive and legislative power. Rebut as director of the project, who is responsible for its implementation, should report back to the council of ITER, while the council establishes the goals and tasks.

[Lapina] But how were the candidates selected, according to what principles?

[Chuyanov] The director and deputy directors determined how many specialists and of what specialties are needed. The parties nominated candidates for the posts of chiefs of the divisions, who were interviewed first by the deputy directors, then by the director. On the average there were four candidates per place. The best ones were selected.

[Lapina] According to what principle were the divisions organized?

[Chuyanov] According to the functional principle. By systems of the machine.

The next organizational stage is the selection of the supervisors of the groups. Again four candidates each, who are nominated by the parties, are seeking one place. The final stage: the formation of the entire team. In other words, all the project participants go through competition. Each party should provide a fourth of the membership of the team, and we are trying to observe this quota, but not to the detriment of quality.

[Lapina] Are you contemplating the enlistment of representatives of a fifth party?

[Chuyanov] This issue is specially stipulated in the agreement. In general the participation of a fifth party is not envisaged, but each country within its quota can enlist whomever it wishes.

The design work of the central group of approximately 200 people will be performed over approximately six years. During this time it is necessary to conduct research in the amount of \$1 billion. Each of the parties should perform research at home in an amount that is equivalent to \$40 million a year—in accordance with the decisions of the project director. Money does not cross boundaries.

[Lapina] The meeting of the financial obligations by our party interests me. Are we really capable of meeting them in the full amount given the present financial situation? Some difficulties arose, as far as I recall, back during the period of the USSR, did they not?

[Chuyanov] Our party, like all the others, actually does not have currency obligations. It should support its own team. The ministry will pay me and all our people wages in accordance with our wage rates, the French accordingly pay the French, the Japanese pay the Japanese.... For jobs performed in our country we pay in rubles, although the director drew up the specifications for them and he will accept them. Our currency expenditures are limited just to the expenditures on business trips.

[Lapina] But the equal participation of each of the parties in the project is presumed, is it not?

[Chuyanov] Not financial. How much jobs will cost in a country is the affair of the country. It was a matter of equal participation by people and of the carrying out of specific developments.

Our total expenditures on ITER should be on the order of \$2.5-3 million a year for the accomplishment of foreign tasks, plus a sum equivalent to \$40 million at world prices is needed for the performance of research and design work in the country. Our scientist is worth tenfold more than they pay him. When we signed the agreement, the ratio of the ruble to the dollar was approximately 1:1.

[Lapina] So, the ruble was thus never worth....

[Chuyanov] No, in our field it was worth even more. You simply do not know the prices for equipment and our specialists. We had an excellent idea of what we are strong in and what work we can do. We realized that for 40 million rubles [R] we can do work that is valued in the West at \$40 million. Our total expenditures on the thermonuclear program at that time were on the order of \$150-180 million. Therefore, R40 million came to 25 percent of the total expenditures, and there was no problem for their redistribution within the existing program. During this year the ruble was furiously devalued, now it is worth approximately 4 kopecks, while the government increased the allocations for our work by a factor of four. In fact the government cut incredibly the allocations for science, and accordingly for thermonuclear science. Now the exchange rate is beyond reason. In our field a dollar, I think, is now worth about R20.

Back before the initialing of the agreement we sent documents to the Council of Ministers, the Ministry of Finance, the Ministry of Science, the Higher School, and Technical Policy, and the Ministry of Foreign Affairs. In the document all our spending was indicated, and in April we received the decision of the Council of Ministers on the possibility of signing the agreement.

To this day we have not received either currency or ruble assets for the conducting of domestic research. Moreover, inasmuch as the account of the Ministry of Atomic Power and Industry at the Bank for Foreign Economic Relations was frozen, we were forced to perform all work on credit. To our inquiries the high authorities responded: "If you sign the agreement, there will be money." As far as I know, the question was recently discussed at the very top. Incidentally, by current standards we are asking for very little: on the order of \$1.5 million for currency backing and in the neighborhood of 700 million in rubles.

[Lapina] Perhaps, you are right. When your colleagues in science ask for money for their needs, everyone also says that they are asking for next to nothing. But today the state cannot allot to everyone even this next to nothing. It has to determine priorities....

[Chuyanov] Tell me, why is it necessary today to dock the Shuttle with the Mir station? The scientific significance of this docking is equal to zero. Unfortunately, the majority of our colleague scientists of other fields do not understand what a sluggish bulky and cumbersome thing power engineering has become. It is impossible to change anything in it quickly. It is necessary to lay today the foundation of what there should be in 25 years.

[Lapina] The arguments of the opponents of the thermonuclear direction in general and of the ITER Project in particular do not reduce at all to the fact that its development is inadvisable due to the impossibility of a rapid return. It is a matter of the fact that this in principle is a dead end for practical power engineering in general.

[Chuyanov] But on what do the supporters of such views base themselves? I have not come across a single sound analysis of the problem from the critics of thermonuclear fusion. The world community, as you see, thinks otherwise.

Specialists recognize today three means of solving the energy problem: the sun, fission, and fusion. The solar direction is by no means better than the thermonuclear direction. Not only physicists, but also power engineers and economists have analyzed this. Solar power engineering involves enormous ecological problems, although this does not mean that it is not necessary to work on it. But it is dangerous "to bet on it." If we switch to the use of solar energy, we will have to think about a fundamentally different organization of society, it will be necessary to distribute local low-power sources. I am not saying that this is bad or impossible, but this is a fundamentally new step in the life of society. If you want to preserve the now existing order, it can be a question only of thermonuclear fusion or fission, and, thus, of a difference of three orders of magnitude in safety and, given the improvement of the system of the thermonuclear reactor, six orders of magnitude. Is it worth fighting for this? It is, because Chernobyl gave a terrible scare. In thermonuclear fusion the probability of an explosion simply disappears.

[Lapina] But are the necessary expenditures on the achievement of these orders of magnitude comparable to the expenditures on work on the improvement and perfection of the nuclear power plants now in operation, at which the principle of fission is used?

[Chuyanov] By means of equipment we can only reduce significantly the probability of an accident, but potentially it remains, although its probability— $10^{-8}$  or  $10^{-9}$ —is beyond our comprehension. Accidents, it turns out, occur by no means according to the laws of chance. The probability of Chernobyl was very small. But it happened. I am talking about a fundamental distinction: Are we willing to spend money in order to reduce the probability of an accident, or are we willing to spend it in order to make an accident impossible in principle? These are qualitatively

different tasks, although the accomplishment of one should not exclude the possibility of accomplishing the other.

We do not doubt that technically and physically this problem can be solved, as well as that we will build a safe thermonuclear reactor and it will operate. We do not know just one thing: Will this power be cheap? But we are willing to work on this.

[Lapina] For practical use this question is a fundamental one. For you are asking for money today.

[Chuyanov] We think that it is possible to make the generation of thermonuclear power profitable. If we had not thought so, we would not have undertaken the solution of this problem. The fact that the largest industrial companies of the world are investing money in this and are competing for the right to participate in the project also speaks in our favor. Mitsubishi, Hitachi, and General Atomic realize that participation in the project promises them enormous revenues. Representatives of our industry are also beginning to understand this. Incidentally, a council of enterprises of Russia for participation in the project is being set up.

Thermonuclear fusion is already now practically the only consumer of the products of many sectors of industry, which would simply die. For example, in our country technical superconductivity is dying.

[Lapina] Let us return to the financial aspect of the project. You said that thus far neither a ruble nor a dollar has been allocated. The partners probably understand our situation. Are they willing to assume some of our obligations?

[Chuyanov] Unequivocally no. This is an international agreement, which presumes the equal participation of the parties.

[Lapina] But there are always some loopholes....

[Chuyanov] Of course, they do exist, our partners are actively helping us, but we should do our share of the work.

I will cite an example. We need very much a communication line between Moscow and Europe, and not only we, but also many domestic consumers do. The U.S. Department of Energy is willing to pay for it, but not in the area of ITER. We will use it only 1 percent of the time for the needs of ITER, we should pay for this percent. Symbolically.

Another example. A general travel fund for all the ITER participants exists. Each party should contribute on the order of \$100,000. The partners have not ruled out the possibility of spending a large part of the fund for our needs, but again we should contribute our share.

[Lapina] And in conclusion I would like to find out what understandings it has been possible all the same to reach on the very important and, in my opinion, most tricky

question of intellectual property. For in each country its own laws are in effect, with the exception of Russia, where for the present they do not exist at all.

[Chuyanov] Indeed, the basic difficulty was for the understandings not to be at variance with the legislation that exists in the different countries. In the agreement an entire section is devoted to questions of intellectual property. I quote: "When an item of intellectual property is developed by persons of the central team in the process of fulfilling the agreement, the director should immediately inform the council of ITER and give recommendations concerning in what countries it is necessary to realize the protection of this intellectual property. At the same time each party or its personnel, who have been assigned to the central team, has the right to acquire all the rights to this intellectual property on their territory. The council will decide where and how to protect these rights in third countries. In all instances, when the right of intellectual property has been acquired by one of the parties or by assigned personnel, this party should ensure the free use by the entire central team of this property when working on the tasks, which have been assigned to the central team, as well as guarantee all other parties a free license with the right of sublicensing for the study of developments in the area of controlled thermonuclear fusion as a source of power for peaceful purposes." I will add: The same regulations also apply to the intellectual property, which has been developed by the national teams and is also enlisted for the accomplishment of the tasks of the project.

#### 'RADIKAL' Science News Briefs August 1992

927A0272B Moscow RADIKAL in Russian No 29 (86),  
Aug 92 pp 9, 11

[Article]

[Text]

- **The draft of the State Program for the Prevention and Control of AIDS has been sent to the government of Russia.** The document was prepared by the Ministry of Health of Russia and a committee of the Gosstatnadzor. The program envisages the purchase of medical equipment and drugs, the publication of special literature, the production of means of protection, and the monitoring of changes in the number of patients.

Today in our country there are 558 people infected with the AIDS virus, 81 of them are ill. The forecasts of the World Health Organization promised us by this year thousands of patients. Either we are lucky or we simply do not know the real state of affairs.

- **Bashkir scientists have been left without money.** As ROSSIYSKAYA GAZETA reports, the Ministry of Finance of Russia as of 1 July deprived of their allowance seven institutes of the Russian Academy of Sciences, which are located in Bashkortostan, and has not been paying scientists wages. This was done "in

punishment" for the fact that Ufa refused to pay taxes to the budget of Russia. Meanwhile the academic institutes of Ufa are not at all "sovereign," but are a part of the Bashkir Scientific Center of the Ural Department of the Russian Academy of Sciences. Thus, the decision of the Ministry of Finance is hardly in accord with the law.

All this suggests sad ideas about the status of scientists in the Russian Federation: When the landowners fight, the serfs' forelocks crack....

- **The radioactive waste near Khabarovsk does not present a danger.** Experts of the international organization Greenpeace came to such a conclusion, having visited and carefully studied the radioactive waste disposal center in the vicinity of the kray center.

Perhaps, now public opinion will be set at ease—after all, the population did not trust the conclusions of our experts.

#### **In the Ministry of Science**

On 26 July 1992 Minister of Science, the Higher School, and Technical Policy Boris Saltykov, vice premier of the government of Russia, and French Minister of Research

and Technology Hubert Curien signed the Agreement on Scientific and Technological Cooperation.

The specific areas of cooperation will be specified according to a mutual understanding later, but already now it is clear that it is a matter of major projects and programs, which include both basic research and the sphere of industrial research and new technologies.

The development of direct contacts between research institutes, organizations, and universities is envisaged. Such programs may subsequently lead to the formulation of specialized joint working programs. The exchange of scientists, specialists, and experts will be developed, the practice of scientific training periods will undergo further dissemination. Initiatives, which are connected with the development of technopolises and mixed introduction structures, will receive support.

The agreement envisages the exchange of scientific and technical information and documentation, as well as the protection—and if necessary the assignment—of the intellectual and industrial property rights to the results of joint work. The forms of the assignment of these rights can be the subject of separate agreements.

**Nominations for Ukrainian State Prize for S&T  
Announced**

927A0285A Kiev PRAVDA UKRAINY in Russian  
4 Jul 92 p 3

[Article: "From the Committee for State Prizes of Ukraine in Science and Technology Attached to the Cabinet of Ministers of Ukraine"]

[Text] The Committee for State Prizes of Ukraine in Science and Technology attached to the Cabinet of Ministers of Ukraine reports that the following works have been allowed to compete for the 1992 State Prizes of Ukraine in Science and Technology:

1. B.Ya. Levin, A.A. Goldberg, I.V. Ostrovskiy. The series of works "Research on Integral and Meromorphic Functions."

Recommended by the Physical Technical Institute of Low Temperatures of the Academy of Sciences of Ukraine.

2. Yu.N. Shevchenko, F.G. Makhort, I.A. Motovilovets, V.G. Savchenko, I.F. Kirichok, V.I. Kozlov. *Mekhanika svyazannykh polei v elementakh konstruktsiy* (The Mechanics of Coupled Fields in Members of Structures), a monograph in five volumes ("Naukova dumka," Kiev, 1987-1989).

Recommended by the Institute of Mechanics of the Academy of Sciences of Ukraine.

3. N.M. Protsenko, V.K. Belik, S.M. Stus, N.G. Kvashenko, A.I. Klimovskaya, V.P. Kiryukhin, A.M. Shostak, V.V. Brayko. "The Development and Introduction of an Integrated System of the Automation of the Measurement of Magnetic Fields in Case of the Development, Experimental Studies, and Outgoing Control of Industrial Items."

Recommended by the Institute of Cybernetics imeni V.M. Glushkov of the Academy of Sciences of Ukraine.

4. V.V. Stepanov, V.P. Slednev, V.P. Tereshchenko, V.A. Nozdrachev, N.P. Sokur, V.I. Vasilyev, O.V. Babak, V.A. Chernov. "The Devising of Methods, the Development and Introduction of Information Measuring, Forecasting, and Controlling Systems for the Control of the Heat State of the Hearth of a Blast Furnace, Which Ensure the Industrial Assimilation of a Resource-Saving Technology of the Melting of High-Quality Pig Iron."

Recommended by the Donetsk Metallurgical Plant.

5. V.K. Artamonov, B.N. Belousov, F.N. Gorin, V.M. Yegipko, V.P. Zinchenko, V.V. Ovcharenko, N.V. Rudenko, Yu.M. Tuz. "The Development of an Advanced High-Performance Base of the Automation of Experimental Research Operations in Wind Tunnels, Which Ensured the Development of the 'An' Series of Cargo Aircraft."

Recommended by the Aviation Scientific and Technical Complex imeni O.K. Antonov.

6. A.G. Sitenko. The series of works "Fluctuations and Nonlinear Interaction of Waves in Plasma."

Recommended by the Institute of Theoretical Physics of the Academy of Sciences of Ukraine.

7. V.G. Gavriluk, O.M. Ivasishin, V.V. Kokorin, V.V. Slezov, R.V. Televich, Ye.I. Yakushechkin. The series of works "Phase and Structural Transformations in Solid Solutions With the Micro- and Submicro-Inhomogeneous Distribution of Elements and Their Use for Obtaining New Metallic Materials."

Recommended by the Institute of Metal Physics of the Academy of Sciences of Ukraine.

8. O.-S.G. Vlokh, S.S. Kotsur, L.F. Lutsiv-Shumskiy, I.I. Polovinko, N.A. Romanyuk, I.V. Stasyuk, Ya.I. Shopa. The series of works "Studies of Parametric Phenomena in Crystal Optics."

Recommended by Lvov State University imeni I.Ya. Franko.

9. V.D. Parkhomenko, P.N. Tsybulev, P.I. Soroka, B.V. Tkachuk, S.A. Yukhimchuk, V.G. Vereshchak. "Plasma Chemical Processes: The Physical Chemical Principles, Technology, Application."

Recommended by the Institute of General and Inorganic Chemistry of the Academy of Sciences of Ukraine.

10. V.I. Kolodyazhnyy, B.M. Krasovitskiy, L.Ya. Malkes, D.G. Pereyaslova, V.P. Seminozhenko, T.A. Serdechnaya, V.M. Shershukov, L.M. Yagupolskiy. "The Development of Organic Phosphors and Luminescent Materials, the Organization of Their Production in Ukraine, and Introduction in Various Branches of the National Economy, Science, and Technology."

Recommended by the Institute of Single Crystals of the Academy of Sciences of Ukraine, the Institute of Organic Chemistry of the Academy of Sciences of Ukraine, and the Rubezhanskiy Krasitel Production Association.

11. A.M. Grodzinskiy, N.I. Dzhurenko, A.P. Isaykina, A.F. Lebeda, N.M. Makarchuk, V.D. Osetrov, V.G. Sobko, V.V. Krivenko. *Likarski roslyny: entsyklopedychnyy dovidnyk* (Medicinal Plants: An Encyclopedic Reference Book) (URE, Kiev, 1989).

Recommended by the Central Botanical Garden imeni N.N. Grishko of the Academy of Sciences of Ukraine.

12. M.D. Zerova, L.A. Dyakonchuk, V.M. Yermolenko, V.A. Mamontova, T.P. Kolomoyets, B.M. Mamayev, E.P. Narchuk, S.Yu. Sinev. The three-volume edition *Nasekomyye-galloobrazovateli kulturnykh i dikorastushchikh rasteniy yevropeyskoy chasti SSSR* (Gall-Forming Insects of Cultivated and Wild Plants of the European Part of the USSR) ("Naukova dumka," Kiev, 1988, 1989, 1991).

Recommended by the Institute of Zoology imeni I.I. Shmalgauzen of the Academy of Sciences of Ukraine.

13. S.M. Kochubey, O.I. Volovik, S.V. Manuilskaia, S.K. Sytnik. "The Physical Chemical Mechanisms of the Mutability of the Membrane System of Chloroplasts in Connection With the Regulation of the Process of Photosynthesis."

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Recommended by the Kiev Institute of Construction Engineering and the Union of Civil Engineers of Ukraine.

30. P.A. Gerasimenko, A.I. Kolomiyets, V.A. Korlyuga, A.V. Klyaznika, A.P. Melnikov, P.I. Petimko, N.F. Tsarik, G.L. Smilyanskiy. "The Development and Introduction of a New Highly Efficient Integrated System of the Operation of the Water Supply and Sewer System of a Large City."

Recommended by the Production Administration of Water Supply and Sewer Services of the city of Kiev.

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Recommended by the Institute of Grapes and Wine "Magarach."

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Recommended by the Kiev Technological Institute of the Food Industry and the Sakhar Scientific Production Association.

34. K.V. Shestakova, V.Ya. Kolomiitsev, V.A. Vyletok, A.V. Solovyanenko, L.A. Granovskiy, D.A. Iordanidze, Yu.V. Kopylov. "The Development and Industrial Introduction of Synthetic Ropes of Twisted Design."

Recommended by the Kharkov Rope Plant.

#### Textbooks for Students of Higher Educational Institutions

1. P.G. Kostyuk, D.M. Grodzinskiy, V.L. Zima, I.S. Magura, Ye.P. Sidorik, M.F. Shuba. *Biofizika (Biophysics)* ("Vyshcha shkola," Kiev, 1988).

2. K.I. Kulchitskiy, I.I. Bobrik, A.P. Ditkovskiy, A.B. Kobzar, M.P. Kovalskiy, S.A. Soloreva, V.S. Shchitov. *Operativnaya khirurgiya i topograficheskaya anatomiya (Surgery and Topographic Anatomy)* ("Vyshcha shkola," Kiev, 1989).

3. M.A. Pavlovskiy, L.Yu. Akinfiyeva, O.F. Boychuk. *Teoreticheskaya mekhanika (Theoretical Mechanics)* ("Vyshcha shkola," Kiev, 1989, 1990).

Recommended by the former Ministry of Higher Education of Ukraine.

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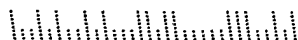
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